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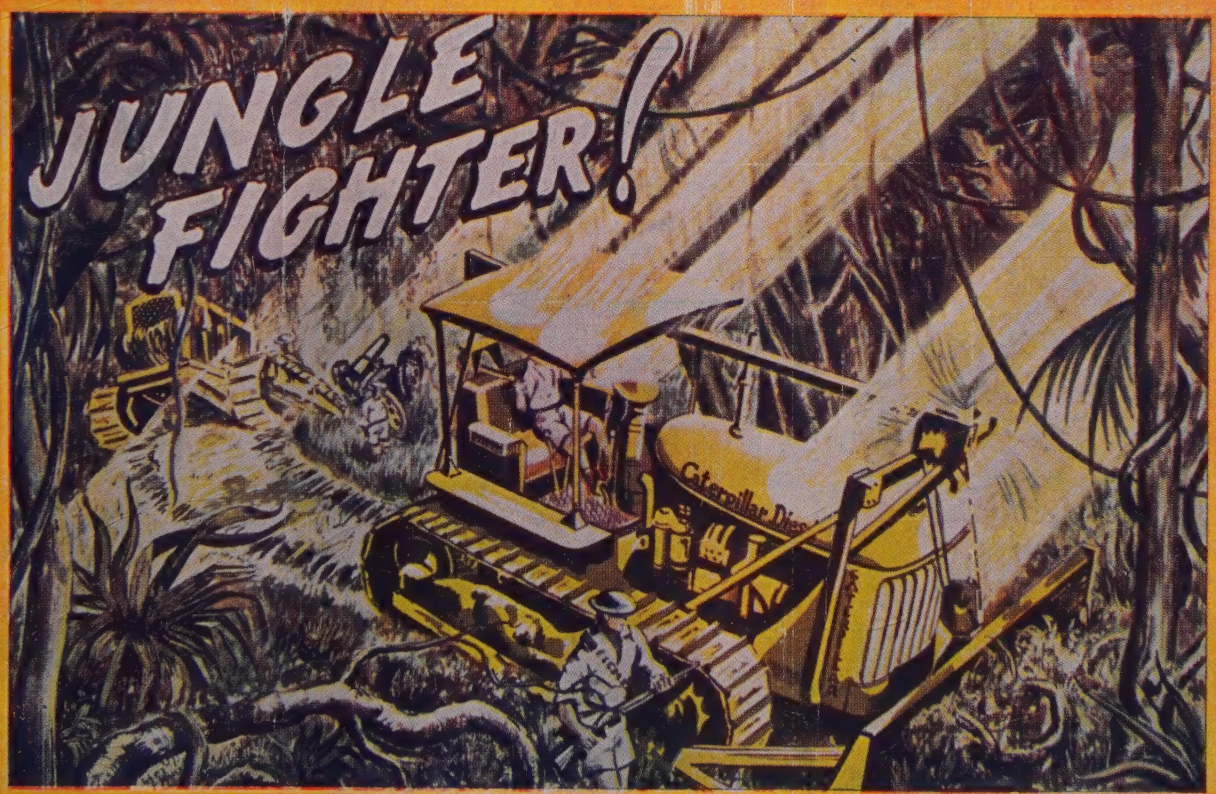

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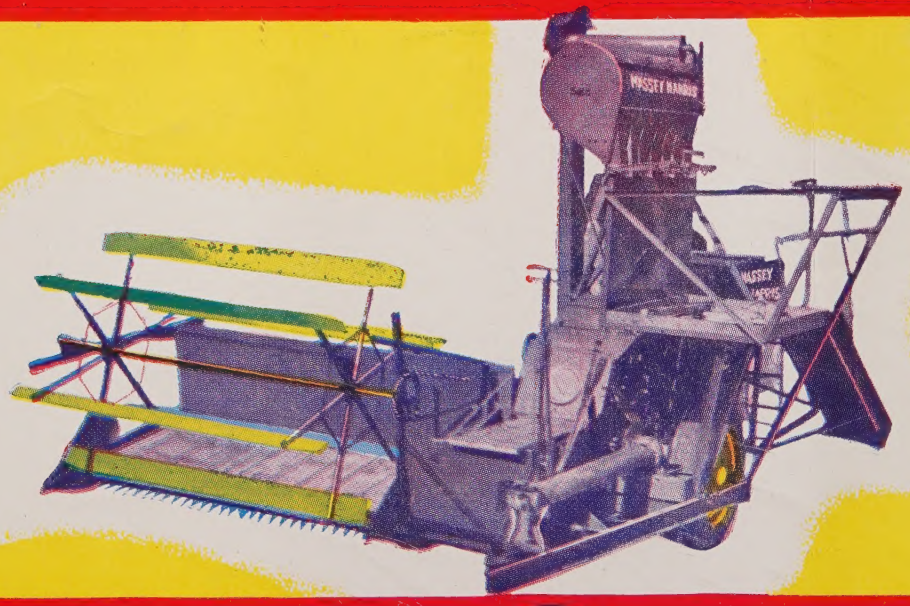

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THE NEW ZEALAND
JOURNAL OF AGRICULTURE
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The Cleaning of Milking Machines

While the information in this article was first issued by the Department in 1924, it should now be read in conjunction with the article, "Conservation of Rubberware" which appeared in the September, 1943, issue of the Journal. It will be noted that while the latter goes a step further in the treatment of rubberware it does not alter the daily cleaning practice, but rather emphasises the fact that the statements made previously are as true today as they were in 1924.

THE cleaning of milking-machines by what is now commonly termed "the boiling-water and caustic-soda method" has been extensively practised for a number of years, and has stood the test of time. No other known method has proved so satisfactory with respect to cleaning efficiency combined with simplicity, speed, and cheapness in operation.

THE LAYOUT OF THE MILKING-MACHINE.

The more compact the layout of the machine the greater the ease in cleaning. Various types of machines are in use, and of these "the releaser and vacuum-tank" type is the most common. A few comments about the layout of this type of machine will serve to indicate how the method of cleaning can be usually applied to the best advantage.

The overhead milk-pipe running through the shed should not be placed higher than is really necessary, and if possible should lead directly into the releaser without elevation. Rather should it have a fall of about 1 in. to each 7 ft. of length towards the releaser and be well supported by brackets at distances close enough to prevent sagging. The main vacuum-pipe should have a similar fall towards the vacuum-tank, and the pulsation or air pipe should be so installed as to have a fall in the same direction. Piping installed in this manner is easily accessible for cleaning, and effective draining is ensured.

THE VACUUM TANK.

The vacuum-tank is provided to supply a reserve of vacuum and to maintain a more balanced suction throughout the machine. In addition, it is of great importance in the cleaning of the machine as it enables all vacuum and pulsation pipes to be flushed with boiling cleansing solutions. The vacuum-tank should therefore be of sufficient size to hold the water used in flushing the pipes. It should be fitted as close to the vacuum-pump as possible so that the whole of the milk and air pipes can be flushed, practically back to the pump, and be within easy access from the floor. Milking-machines which have no vacuum-tank should be provided with a vacuum-pump through which the water can be discharged. The vacuum-pipes should be connected to the body of the vacuum-tank, leaving the lid loose and detachable. A hinged drainage flap, some 3 in. wide, similar to a releaser flap should be provided. This will release the flushing-solution immediately air is admitted at any part of the machine, and close again for the final flushing as soon as suction is applied.

Contributed by the Dairy Division

THE RUBBERWARE PARTS.

Rubberware of first-grade quality is the best and cheapest to use. Tubing and inflations, when new, possess a very smooth inside surface, and this condition can be maintained for a long period, provided the method of cleaning is properly carried out. Spiral brushes or metal scrapers should not be used for cleaning the inner surface of rubber tubing, as they cause scoring and roughening of the surface, which create lodging-places for deposits of milk and germs, with disastrous results both to the rubber and the quality of the milk. Fat and grease are the greatest enemies of rubber, and deposits of such will very quickly cause the inside surface to perish, leaving cracks and holes in which the milk lodges and putrifies. The effect on the rubber is to cause it to become soft and spongy. The boiling-water and caustic-soda method of cleaning will promote a smooth, hard inner surface which is hygienic and easily cleaned and the life of the rubberware will be materially lengthened.

THE MATERIALS AND APPLIANCES REQUIRED.

The principal requirements are:—

(1) **An adequate supply of clean cold water.**

(2) **Suitable means for providing sufficient boiling water at the milking-shed for the cleaning of the machine after each time of using, such as an efficient electric heater, steam boiler, or a copper.**

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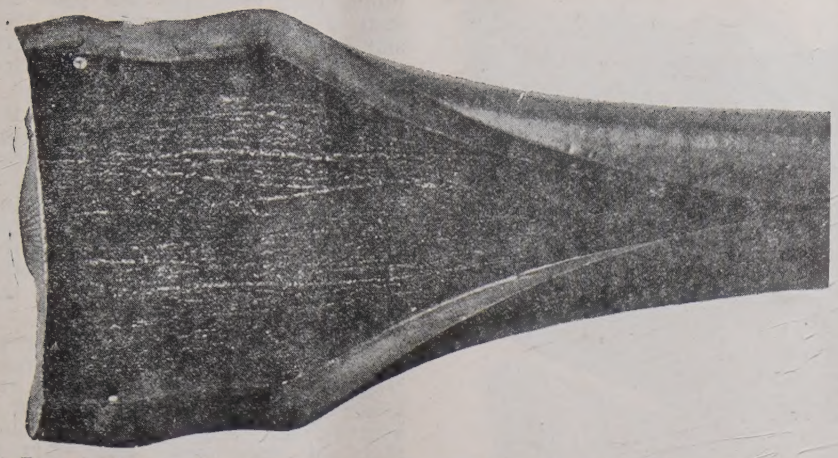

Fig. 1.—Long milk-rubber after twelve months' use and cleaning daily with boiling water, washing-soda, and the use of a brush and scraper. Note the scored inner surface of the tube.

(3) **A metal bath or tub of suitable size, some large buckets, scrubbing-brushes of the dairy type, horse-hair plug, or a small pipe-traveller hair brush, and an ample supply of caustic soda.**

(4) **A dairy thermometer registering to 212 deg. F. or a few degrees over.**

For cleaning cans, separator parts, etc., a supply of soda ash should be provided.

STRENGTH OF THE BOILING-WATER CAUSTIC-SODA SOLUTION.

The correct strength of the solution to use is one full teaspoon of caustic soda to each 4 gallons of boiling water. If this strength is adhered to, and its use immediately followed by rinsing out with at least double the quantity of clean boiling water, no damage will be done to the rubber or other parts of the plant. A stronger solution will in time remove the tin from the metal pipes.

APPLICATION OF THE BOILING-WATER AND CAUSTIC-SODA METHOD.

The procedure is as follows.—

(1) After starting the machine, and before commencing to milk, draw some clean cold or warm water through each set of teat-cups, taking care that the water does not run into the milk vat or cans. This rinsing with water prevents adhesion of milk to the piping.

(2) Wash off all dirt from the outsides of the teat-cups and rubber tubing with a solution of warm water and soda, and rinse well with hot water.

(3) Immediately after milking and **before applying the boiling caustic-soda solution,** draw plenty of cold or lukewarm water through each set of teat-cups, in order to rinse out any milk remaining in the system. Hold the cups alternately in and out of the water to allow a rush of air through the pipes. This will give a spraying effect and more thorough rinsing. Failure to use sufficient water before the application of the boiling caustic-soda solution will result in the gradual formation of a hard scale, commonly called "milkstone," in those parts of the machine with which the milk comes in contact. Sufficient water should be used so that it runs clear from the releaser and without any trace of milk. It is generally found that the releaser is the first part of the machine to collect milkstone; and this is due to the rinse water being insufficient. The rinse water collects milk from the cups and pipes, and if the quantity used is not sufficient the coating of milk which is left on the releaser is burnt on to the metal by the boiling water which follows. Lukewarm water is even better than cold water for rinsing the milk-pipes, but if too hot it will cause a deposit of milkstone.

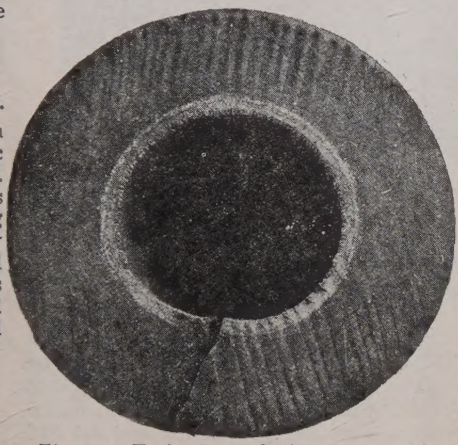

Fig. 2.—End view of the same rubber *(Fig. 1)*. The whitish inner circle indicates the scored surface of the tube.

(4) Put the releaser out of milking action by stopping the pulsator, if possible, at a point that will cause the outside flap of the releaser to seat tight. (Where the pulsators are allowed to operate during the washing process, cold air is admitted to the water and the efficiency of sterilization is lost.) Remove the milk-vat and place a bucket under both the releaser and vacuum-tank to catch any soda solution which may be released during the flushing process. Draw through each separate set of teat-cups at least 1 gallon of boiling caustic-soda solution. The cleaning will be more efficient if the practice of starting the flushing in a different bail after each milking is followed, or, better still, if the soda solution and final rinse water are each put through two or more sets of cups at a time.

After drawing the soda solution through the set of tea-cups farthest from the releaser, carefully lift the flap or remove the plug at the end of the main milk-pipe and insert a tightly-fitting plug of horse-hair or the pipe-traveller brush, retaining hold of same until the vacuum again rises, and simultaneously remove the plug for a moment and allow the horse-hair or brush to whisk into the releaser. This should be carefully done, because if too much air is allowed to enter suddenly the hand of the pressure-gauge will drop hard against the zero pin. This will in time affect the reading of the gauge and allow a higher vacuum in the machine than is registered by the low-reading hand. Replace the

Fig. 3.—Claw-tube rubber from the same machine as milk-tube in *Figs. 1 and 2.* The indentations indicate effect of lodgment of grease.

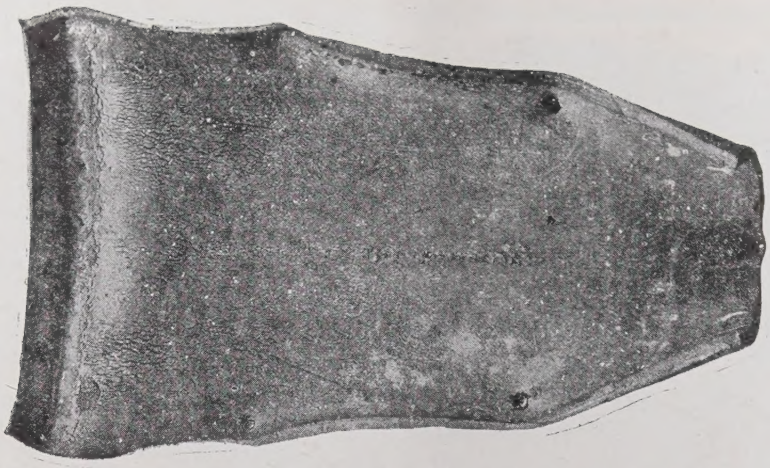

Fig. 4.—Ordinary teat-cup soft inflation after three months' use, showing the effects of brushing.

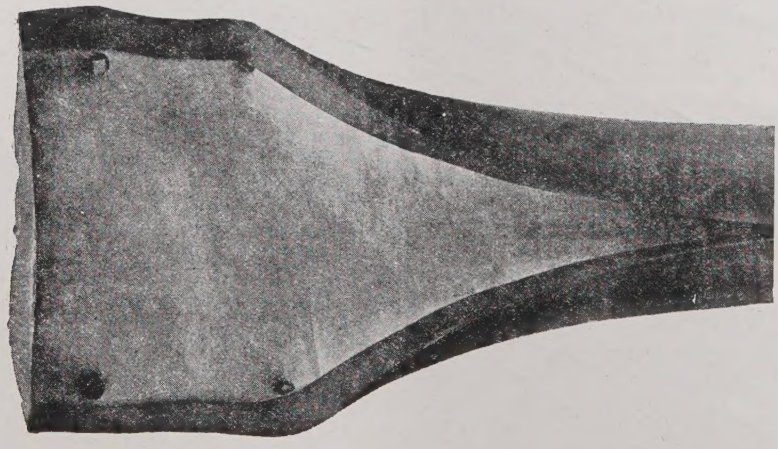

Fig. 5.—Long milk-rubber after two seasons' use and cleaning daily by the boiling-water and caustic-soda method.

flap or plug and complete the flushing of the remaining teat-cups. The water will fill the releaser and will overflow into the vacuum-tank. Again break the vacuum by removing the plug from the end of the milk-pipe. The contents of the releaser and the vacuum-tank, if it is fitted with an automatic flap, will discharge into the buckets. If the vacuum-tank is fitted with an ordinary tap, open it and allow the soda solution to discharge. Then replace the pipe-plug.

The soda solution is applied with the best results by dousing the cups in and out of the liquid, about three-quarters of the time in and one-quarter of the time out. The resultant inrush of air quickens the flow of the liquid and causes it to surge with a scouring action through the piping.

(5) To remove all traces of the soda solution, immediately draw through each set of teat-cups at least 1 gallon of clean boiling water. The final flushing of boiling water should be passed through the machine without the admission of air, so that the maximum heat can be retained and the full value of sterilization obtained.

The quantities of the boiling liquids should be sufficient to fill the system and overflow the releaser by, at least, 1 gallon in the smallest machines, thus cleaning the pipe between the releaser and vacuum-tank. In addition, as a result of stopping the pulsator, the hot water is retained in the system and the heating temperature is maintained.

(6) The vacuum and air system should next be cleaned. A burst inflation will cause milk to reach the pulsation and vacuum pipes, and these are also contaminated by oil from the pulsators and milk vapours from the releaser. It is therefore imperative that these and the backs of inflations be regularly flushed. Detach the air-tubing from each claw and place the ends in boiling caustic-soda solution, and draw up at least a quart through each, then rinse with clean boiling water. The backs of some types of inflations can be flushed by lifting the mouthpiece slightly and allowing the ring to seat at an angle to the cup. This will allow the water to flush through, and it will pass through the tubing under the pulsator-slide into the main vacuum-pipe and into the vacuum-tank. With this type of inflation there is no need to detach the air-tubing as stated above.

(7) Next detach the rubber tube commonly known as the breather pipe from the lower chamber of the releaser, and draw through it about a quart or more of the boiling soda solution, and then some clean boiling water. These fluids will also travel to the vacuum-tank. The cleaning to this stage is as much as need be done under vacuum.

(8) Leave all taps and ends open to allow the free circulation of air, then stop the machine.

(9) Next scrub and scald the vacuum-tank.

(10) Dismantle the releaser and scrub and scald it.

(11) Disconnect the teat-cups and rubbers from the milk and air pipes and place them in a dry, airy, clean place protected from dust and the rays of the sun.

SINGLE-PIPE MACHINES.

In the case of the single-pipe machine a slight variation from the procedure just described is required. After rinsing the milk system, stop the pulsator so that both ports are covered by the slide. Set the rings of the inflations at an angle to the cup as already described, and rinse with cold water followed by caustic-soda solution and clean boiling water. Re-

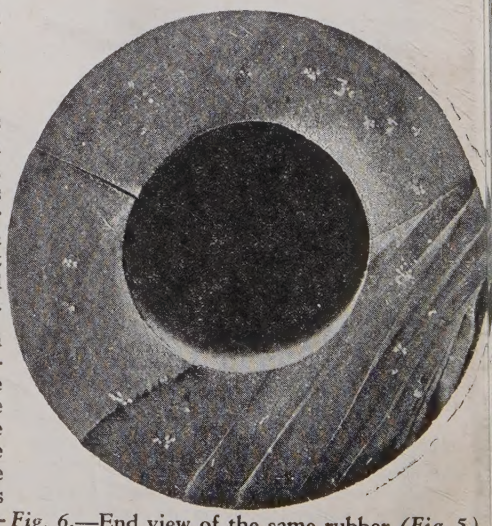

Fig. 6.—End view of the same rubber *(Fig. 5)*

place the rings in position and proceed with the washing of the milk system as described for the double-pipe machine.

The short experience of low-level machines which is at present available seems to indicate that the suction method of cleaning is not so effective with this type. This is probably due to the lower vacuum, and consequently the upper half of the milk-pipe is not cleaned as efficiently as it is in the older type. To ensure thorough cleaning, it is suggested that the pipe should be completely filled with each of the three lots of water recommended above.

It is essential that the temperature of the hot water used be not less than boiling-point—i.e., 212 deg. F.—when taken from the vessel in which it is heated. A thermometer should be used to check the temperature. Too little boiling water is often used, but rarely too much.

To produce milk of good hygienic quality, milking-machines should be regularly cleaned as outlined each time after use. With practice, the average machine can be cleaned in about 20 minutes, if the work is started immediately milking is finished.

If, for any reason, the washing cannot be proceeded with immediately after the milking is finished, at least rinse out the plant to remove all traces of milk before leaving it.

Fig. 7.—Claw-tube rubber from the same machine as milk-tube in *Fig. 5.*

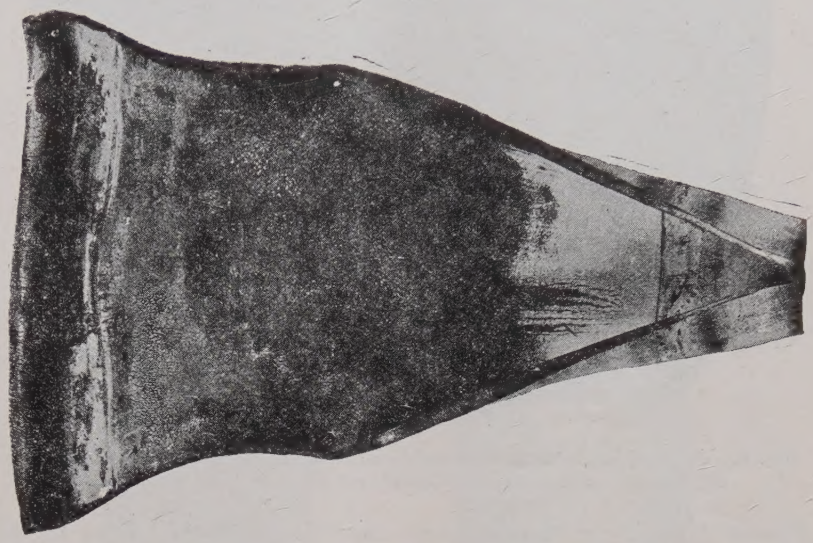

Fig. 8.—Ordinary teat-cup soft inflation after four months' use and cleaning by the boiling-water and caustic-soda method.

REMOVAL OF MILKSTONE.

If a milking-machine is not regularly flushed with cold water to remove all traces of milk prior to treating with hot cleaning-solution, a hard deposit readily forms inside the pipes. This "milkstone," as it is called, enables germs to multiply, and special steps mut be taken to get rid of it. The simplest method is to use a weak solution of spirits of salts (hydrochloric acid), immediately followed by liberal rinsing with hot-water-soda solution. The procedure is to dismantle the piping and prepare a solution of spirits of salts in the proportion of one part of spirits to three of water. In some cases a stronger solution may be required. To each 7 ft. length of piping use 8 oz. of the solution, or about a breakfastcupful. Plug one end of the pipe, pour in the solution, then plug the other end. Allow the solution to remain in the pipe for about 30 minutes, revolving the pipe occasionally to ensure distribution of the solution so as to soften the scale. Remove the plugs and clean the pipe with hot soda ash solution and a tight-fitting hard brush; then rinse with clean boiling water. This treatment, properly applied, will leave the surface clean and bright.

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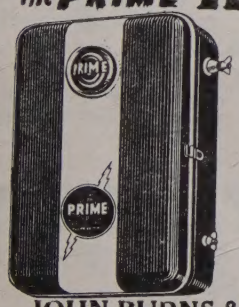

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Fig. 9.—A grooved hard teat-cup inflation after twelve months' use and cleaning by the same method. Capable of three months' further use.

Figures 10 and 11 are illustrations of half-sections of a length of pipe before and after treatment by this method.

On some farms a mineral deposit from the water used for cleaning the milking plant may be mistaken for milkstone. This is also undesirable in the milk-pipe, and the same treatment is recommended for its removal.

STEAM STERILIZATION OF MILKING-MACHINES AND DAIRY UTENSILS.

The "boiling-water and caustic-soda method" of cleaning, properly applied, leaves the milking-machine in a satisfactory hygienic condition. A further improvement is still possible by afterwards subjecting the inside parts of the machine to steam to effect sterilization. Steaming should be continued until a thermometer held in an outlet at the end of the plant farthest from the steam inlet shows 212 deg. F. Steam sterilization prior to milking is also an advantage provided the pipes are allowed to cool before starting.

Steaming alone will do harm rather than good, since, if the machine and utensils are not first thoroughly cleaned to remove all traces of milk, the application of steam (or even boiling water) not preceded by adequate flushing with cold water will have the effect of causing hard deposits of milkstone to form in the machine. Such deposits accumulate from day to day and harbour countless millions of bacteria which resist prolonged efforts to destroy them. It should not be thought that the use of steam alone provides a short-cut to cleaning a machine. Proper cleaning with cold water, boiling caustic-soda solution, and boiling water should be carried out before steaming.

For sterilizing dairy utensils steam may be generated in a small low-pressure boiler, which can also be used to provide ample hot water. Such boilers have the advantage of developing sufficient pressure to force the steam to the farthest end of the milking-machine pipes, but are not required to have a certificate of inspection. During the last few years a variety of heating plants have been designed to provide readily an ample supply of both boiling water and steam by burning wood, coal, fuel oil, etc. Some of these are provided with a coil in the furnace which raises the steam to a very high temperature. Where this type of heater is used it is advisable to place it some distance from the inlet to the milking-machine. Sterilization with steam gives the finishing touch and is the best safeguard of quality, provided the machine is first thoroughly washed.

DAIRY UTENSILS.

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ing into contact with other equipment, coolers, cans, separators, etc., which, although well washed, have not been sterilized. Consequently, these should also be thoroughly steamed or scalded with boiling water. Cans are treated most effectively by inverting them over a steam-jet. The cooler may prove difficult to sterilize unless it is of such a size that it can be placed inside a suitable can or tank. After detaching from the water-supply to wash it thoroughly, the cooler can be sterilized by connecting a steam-hose to the water inlet. In cases where a small tank is used as a steam-chest, care must be taken that steam is turned on long enough to ensure the whole contents being adequately treated. To ascertain this, a thermometer should be inserted as near as possible to the bottom of the tank, at the opposite end from the steam inlet, and the flow of steam should be kept up for five minutes at least after 210 deg. F. is registered.

THE USE OF DISINFECTING COMPOUNDS.

It is many years since coal-tar disinfectants and similar carbolic fluids were first used as dressings for teats, but traces of tnese inevitably reach the milk and cause undesirable flavours. For that reason it has been found necessary to prohibit their use by regulation.

When used to wash the udders, a cloth and a bucket of water soon become filthy and spread germs from one cow to the next. The best method is to apply water by means of a rubber hose and rub the teats with the hands. If desired, a satisfactory odourless material for a final rinse is a dilute solution of Condy's crystals (permanganate of potash). Sufficient should be used to colour the water a deep pink (avoid making it a dark red), and when the pink disappears it is time to obtain clean water and use more crystals. In any case, it is most important to finish by wiping the udder free of dripping water with a **clean** cloth which has been wrung out of fresh Condy's solution.

In recent years the desire to improve the hygienic condition of milking-machines has provided the opportunity for persuading farmers to use various chemical disinfectants, particularly those having a chlorine basis, such as bleaching-powder or chloride of lime, hypochlorites, etc. It has been noticed repeatedly that whenever these compounds are used for the purpose of sterilizing milking-machines, cans, etc., excessive amounts invariably find their way into the milk and cream. Cases have been observed where suppliers were getting the highest grade regularly for their milk or cream and suddenly changed to second grade. Upon investigation it was found that some

Fig. 10.—Half-section of main milk-pipe affected with milkstone.

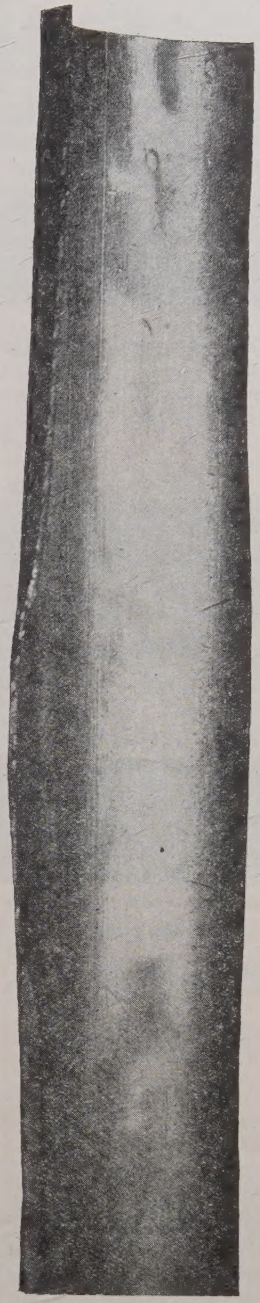


Fig. 11.—Half-section of similar pipe after treatment.

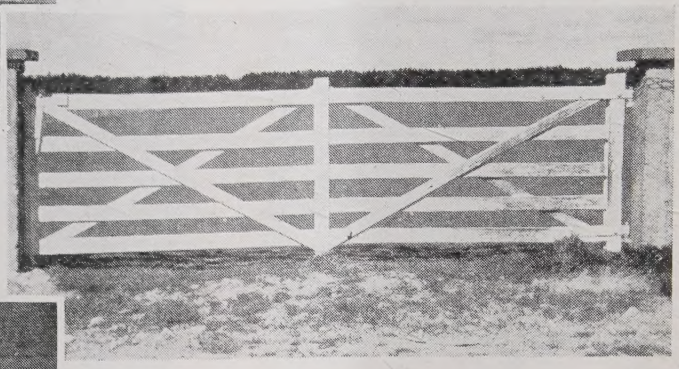
chemical sterilizing-solution had been used without proper care. Metals, especially in parts of a milking-machine, are very readily corroded by strong chlorine solutions.

Chlorine is not a cleanser, and if the machine is not thoroughly washed before the solution is used it will attack the residue of milk left in the pipes through inefficient cleaning and cause oxidation flavours in the milk and cream. To ensure efficient cleaning, the boiling caustic-soda solution is required, and the final scalding with clean boiling water, followed by steam when it is available, will give the final heating which is all that is required.

The foregoing instructions will not apply in every detail to all makes of milking-machines, but they can be modified to suit practically any plant at present in use.

Farm

A good farm gate; well stayed and well swung.



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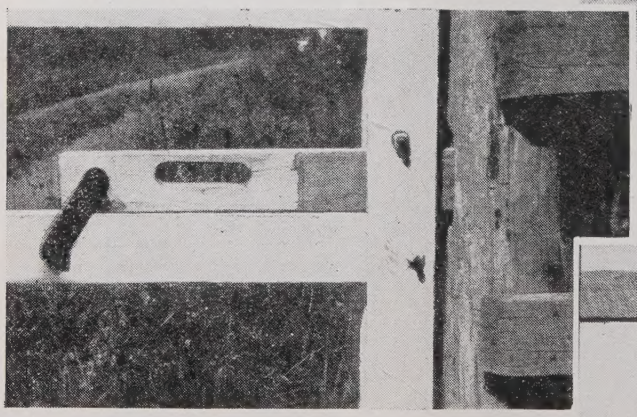
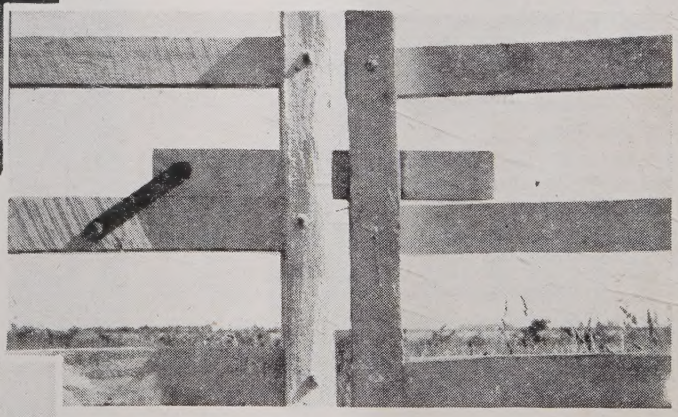
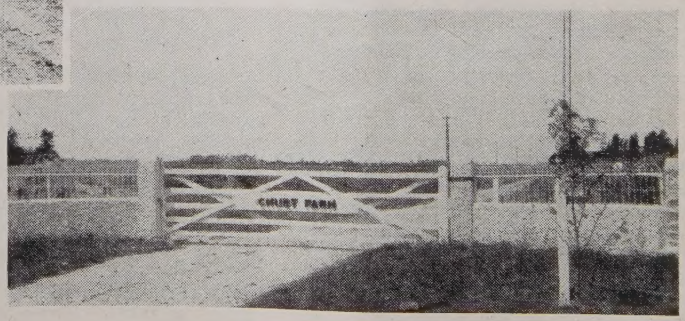


A simple but effective fastening.



This fastening can also be used for double gates.

This method of blocking a gateway should only be used on the distant parts of the farm. Note how traffic has worn away the surface between the posts.



An attractive entrance gives a good first impression to any visitor.

Gateways

by R. Inch Fields Instructor Ashburton

WHEN one stops to think how often gateways on a farm are used each year, one realises how much time is wasted at a badly-hung gate. A good gate, well hung, is an asset to any farm, but a gate that drags and has to be lifted each time it is opened involves a definite waste of time and a shortening of the life of the gate as well.

With only slight adjustments or repairs, most dragging gates could be made to swing quite freely. A piece of timber nailed along a broken rail, the stay tightened a little, the dog of the top hinge screwed up, or the gatepost itself put back into position—and many of the old gates would have their lives extended for several years.

Types of Gates

There are many good types of gates, although preferences in this matter naturally differ. Two good types are shown in the accompanying illustrations. In the making of a new gate, several essential details must be taken into consideration. A gate that is suitable for a sheepfarmer or agriculturist does not usually need to be as heavy as one that is likely to be rubbed against or pushed about, by horses or cattle. Good, sound timber should be used, and the gate well stayed to prevent sagging when swung. At least two coats of good paint should be applied, when the timber is thoroughly dry, to protect the wood against weathering. This painting should on no account be applied to damp or green timber, or the rotting process will be accelerated instead of checked. Some farmers make a practice of leaving the under-surface of the rails unpainted in order that any moisture absorbed by the timber during wet weather may easily escape.

Solid Support

A good solid post, well sunk into the ground, is necessary to support the gate. This post should not be used as a strainer for the fence, as the pull of the wires tends to alter the set of the post and to spoil the swing of the gate. It is better to have the strainer a few feet away from the gatepost and to fill up the intervening space with rails or netting. In hanging, it is advisable to keep the gate well off the ground and to fill up a portion of the space underneath with shingle or similar material. It must be remembered that all traffic is confined to a small space in a gateway, and wear on the surface is consequently very heavy. Keeping this surface raised prevents water from accumulating and so increasing the wearing process. A foot block let into the ground at the side of the post where the gate is fastened will support the gate when closed, relieving the strain on the post at the opposite end, and also on the gate itself.

There are many types of fastenings or catches from which to choose. Provided the fastening is easy to operate, and yet safe from interference by stock, it does not need to be elaborate. Almost anything is preferable to a piece of twisted wire.

Width of Opening

A 12 ft. opening in a gateway is ample for any ordinary purpose, but with the advent of modern machinery, a wider opening is necessary on some farms. It is advisable to use double gates in that case in order to lessen the strain on the posts. Accordingly, the foot block should be placed where the two gates meet. A low block of concrete with the shoulders sloping into the ground will be the most satisfactory.

All good farmers take a pride in the appearance of their farms, and, where possible, keep fences and gates in good repair. Unfortunately, the initial outlay for both these objects is no small item, and at present labour is difficult to obtain. If a farmer can renew one or two gates each year, when and where necessary, it will be only a comparatively short time before every gate on the farm is in good condition and well swung. In the meantime, the best gates should be placed where they will receive the most use, the older ones being shifted to the back of the farm.

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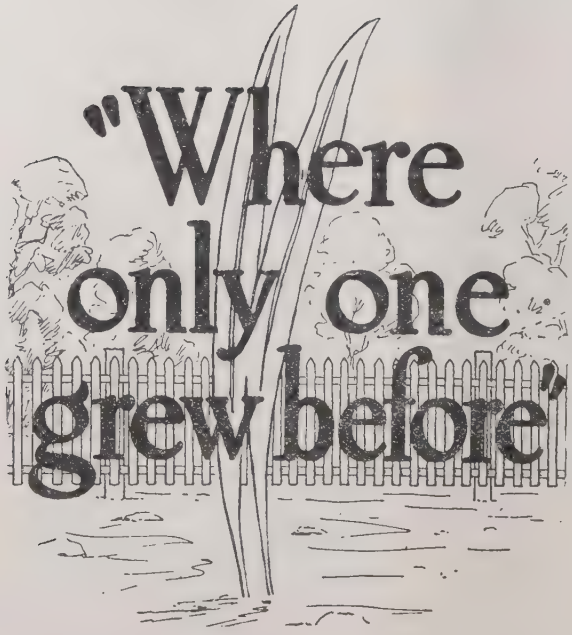

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Grading Tables and Packing Bins For Vegetables

THE increased production of vegetables to fulfil our overseas commitments has necessitated the adoption of new methods of harvesting and packing. To maintain efficient production new equipment has been designed. In this article the grading tables and packing bins now used for the crating and grading of vegetables for overseas supply are described.

THE harvesting and packing of vegetables for market constitute a heavy task, varying in magnitude with the size of the garden. In order to lessen handling, it has been customary to pack the produce in the field, rather than harvest and convey to a shed for packing, and, as there has been very little grading of produce, it has been the practice to pack direct into sacks as the crop is dug or harvested. The crating of vegetables for overseas supply has necessitated grading, and difficulties have arisen in the grading and crating of vegetables in the gardens due to lack of facilities for carrying out the work. It is no longer economic, nor is it efficient, to sort crops on the ground, and some form of grading tables and packing bins has become necessary to ensure satisfactory and speedy work.

— By —
R. G. HAMILTON,
District Supervisor,
Horticulture Division, Auckland.

A simple and cheap means of carrying out the work of grading and crating has been designed, and, with slight modification, should also prove suitable for grading and packing to the proposed vegetable standards for local markets.

GRADING TABLE FOR ROOTS AND ONIONS.

For convenience in shifting, and also storing out of the way when not required, the table has been designed in two pieces—(A) tipping table, and (B) sorting table. The overall dimensions are shown in Figure 1.

When in use the tipping table is fitted up against the wide end of the sorting table to form one unit (Figure 2)

The top of the sorting table is built on an incline to facilitate handling the roots from the tipping table to the crate or sack. It is comprised of wooden slats 1½ in. wide, with ½ in. gap between each slat for the purpose of shedding dirt, and, in the case of onions, the loose skins.

The crate is placed crosswise at the end of the table, and supported on a stool approximately 15 in. in height. Where large quantities are being handled, a roller conveyor to carry the packed crate from the table to the lidding bench should be installed. Where this conveyor is used, the table should be raised so that the height of the bottom lip of the sorting table is 3 ft. from the floor, instead of the 2 ft. 6 in. shown in Figure 1. A length of roller conveyor —usually 8 ft.—is placed crosswise to the table, with one end across the end of the table (on which to place the crate when packing) and the other end at a lidding bench. The height from floor to the top of

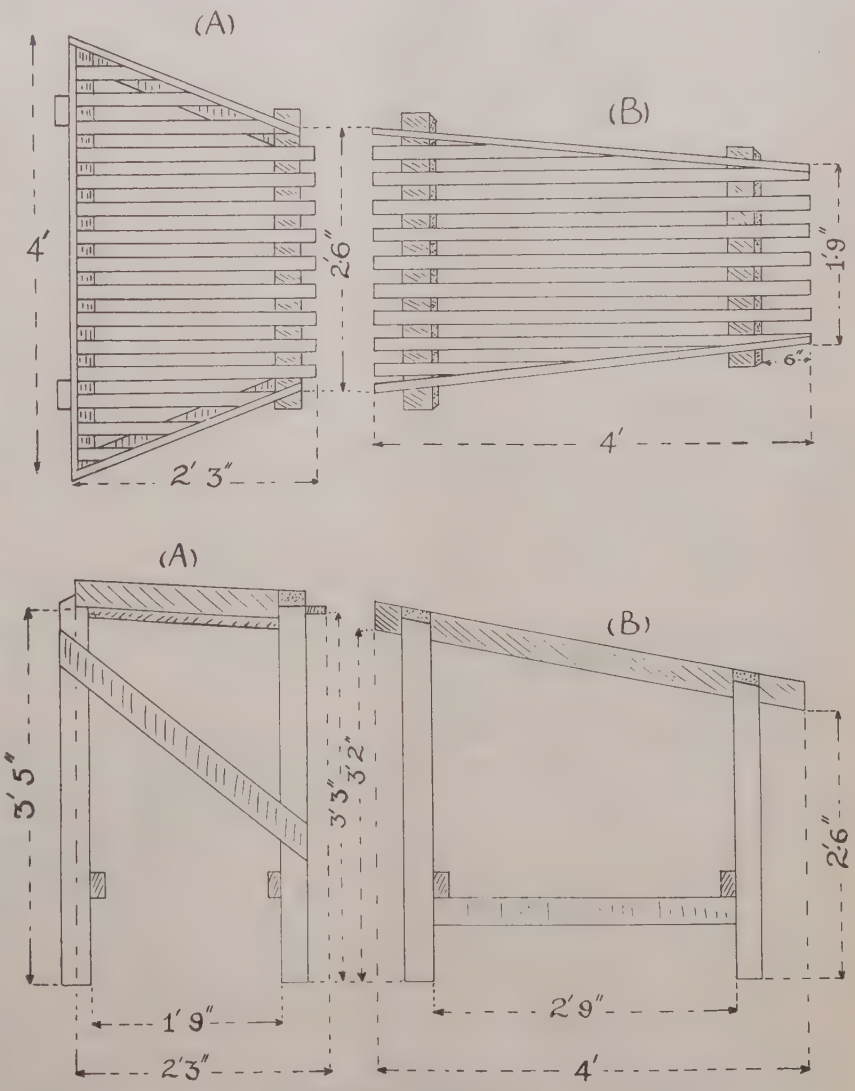

Fig. 1.—GRADING TABLE FOR ROOT VEGETABLES.

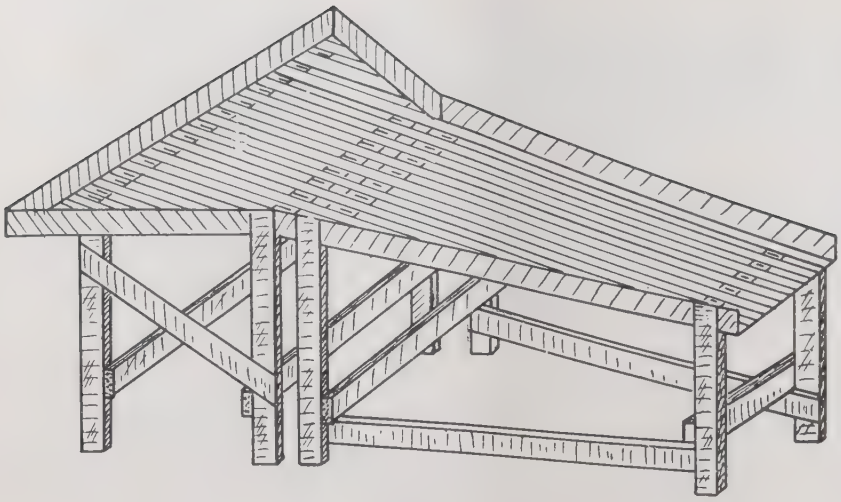

Fig. 2.

the conveyor at the table end should be 22 in., with the bench end approximately 1 in. to 2 in. lower. As each crate is packed it is given a slight push and travels to the lidding bench, thus eliminating the heavy lifting from packing stool to bench.

Where packing is to be done into sacks instead of crates, the mouth of the table should be narrowed from the 1 ft. 9 in. shown in Figure 1 to approximately 12 in. to 15 in., and the height sufficient to allow a sack to be hung on a stand below the mouth of the table.

The table has been designed to accommodate two graders and one packer, but is sufficiently long to enable four graders to operate if necessary. During grading operations the first grade is run into the crate or sack at the end of the table, and the second grade is placed into sacks hung on stands each side of the table.

In constructing the tables the use of dressed timber is recommended. The legs should be of 3 in. x 2 in.; the back pieces, side pieces, supports for slats, and the braces of 3 in. x 1 in. timber. The slats for the tipping table can be 1½ in. x 5/16in. by 26 in. long, with 1¼ in. overlap beyond the underlying support. The slats for the sorting table require to be stronger because of the extra length, and should be of 1½ in. x 1 in. timber. The top edges of all slats should be rounded off. When the two tables are placed together the slats of the tipping table

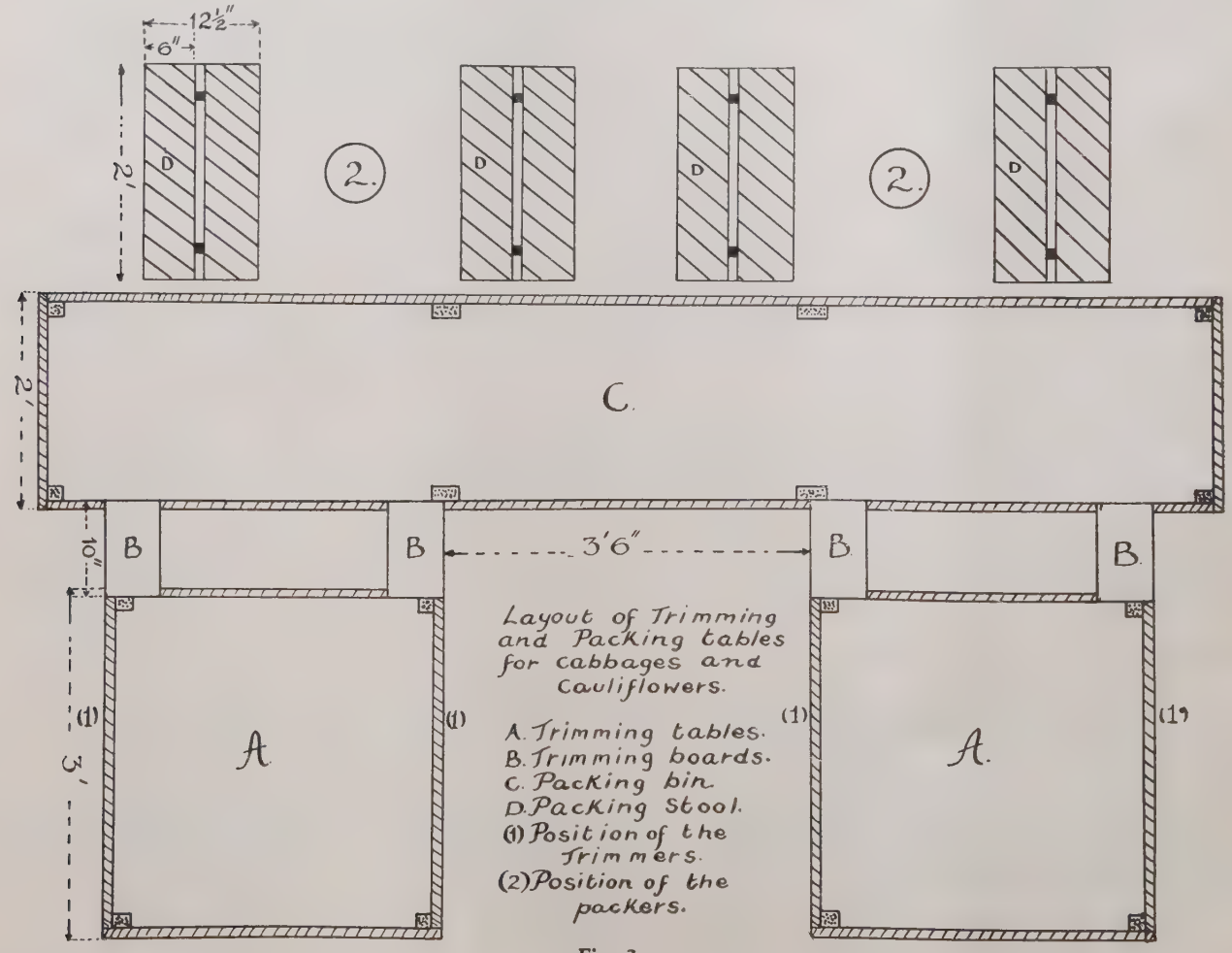

Fig. 3.

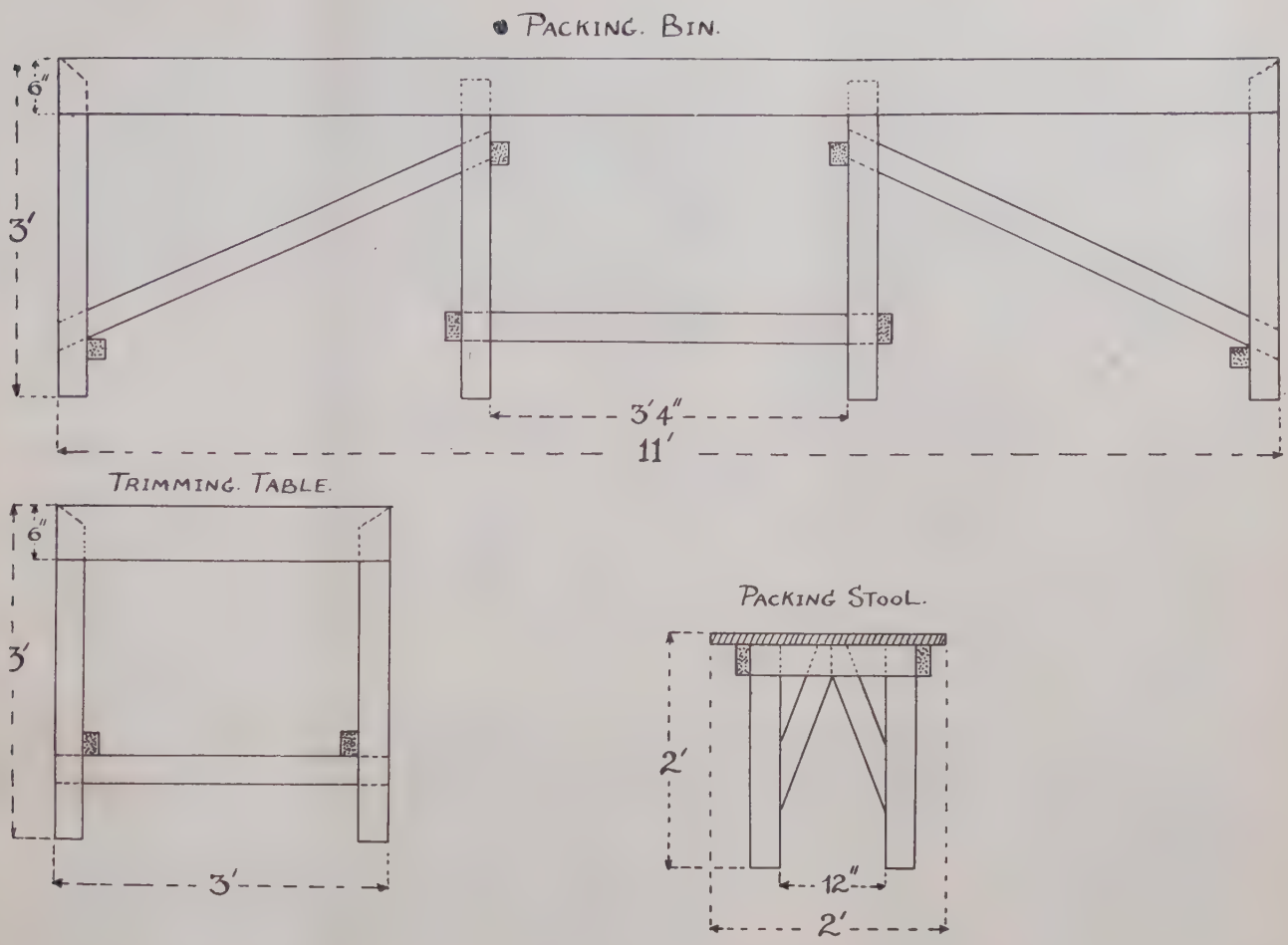

Fig. 4.

should overlap those of the sorting table by 1¼ in.

TRIMMING AND PACKING BINS FOR CABBAGES.

The layout of these bins is shown in Figure 3. There are two bins into which the cabbages are tipped, one long bin into which the trimmed cabbages are placed ready for packing, and four packing stands. These bins are primarily designed for use when packing into crates, and the long bin is designed to obviate piling up the trimmed cabbages.

Where it is desired to pack two grades into sacks instead of crates, only the packing bin (marked C) need be used. This, however, should be 2 ft. 6in. instead of 2 ft. and only 9 ft. long. Cross partitions should be placed approximately 2 ft. 6 in. from each end. During operations the cabbages are tipped into the centre bin and graded into the end bins—first grade at one end and second at the other. The overall dimensions are set out in Figure 4.

Dressed timber is advisable for the construction of the bins. The legs should be 3 in. by 2 in., the sides 6 in. by 1 in., and the braces 3 in. by 1 in. The bottoms of the trimming tables comprise sacking hung loosely from two opposite top edges and hanging to a depth of 6 in. in the centre. The bottoms of the packing bins comprise sacking stretched tightly across and tacked with a thin batten to the bottom edge of the 6 in. sides. The packing stools have 3 in. x 2 in. legs, 6 in. x 1 in. tops and 3 in. x 1 in. braces.

The foregoing tables and bins are sufficiently light to permit of ready transportation to the field, and may be set up and removed from place to place with little delay.

Market gardeners will find that where grading is necessary, the use of such tables will greatly facilitate the work of grading and packing.

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WEEDS

Perennial Weeds

— By —
S. H. SAXBY,
Instructor in Agriculture,
Dunedin.

Piripiri or Bidi bidi (*Acaena sanguisorbae*).—An extremely common and widely spread native plant that, since colonisation commenced, has become a serious weed.

It is harmful in two respects. Firstly, it is not eaten by sheep and its ultimately large plants take up a considerable area of ground that could well be occupied by good grazing species. Secondly, the large number of burrs which it forms are responsible for considerable depreciation in the value of wool in which they are readily carried. An otherwise good fleece may be reduced in value to the extent of 12 per cent. if it contains a large amount of burr. Early shearing and avoidance of paddocks that contain large quantities of burr help to overcome wool damage.

On ploughable country piripiri is of little consequence as it rarely becomes aggressive or harmful in high producing top-dressed pastures. It is on the second and third-class, unploughable country that piripiri has become a menace to the sheep farmer.

With the clearing of bush country, its sowing down with short-lived or unsuitable species and the close grazing by sheep the piripiri has had every encouragement to spread and become a nuisance. Under close and continuous grazing piripiri quickly tends to become dominant.

Control measures available consist solely of stock manipulation and spelling of the pastures. Under close grazing the piripiri sends out its runners which spread and root unhindered on the adjacent closely grazed pasture. When the pasture is spelled the runners are drawn up with the growing grass and are consequently unable to root. Such spelled area should be grazed by cattle which cause considerable damage to piripiri both by grazing and by trampling.

In recent years an insect parasite has been liberated in an endeavour to secure biological control of piripiri. Up to the present time it has not become efficiently well established for an opinion to be formed regarding its value.

Plantain (*Plantago spp*).—Of these there are three common species:—(a) Ribgrass (*P. lanceolata*); (b) Broad leafed plantain (*P. major*); (c) Buckshorn plantain (*P. coronopus*).

The only one of these three that can be regarded as an objectionable weed to the farmer is ribgrass. The other two are of localised occurrence. Buckshorn plantain usually grows on saline mud flats in association with Salicornia or Puccinellia, and is of little moment. Broad-leafed plantain has much the same distribution as ribgrass, but is nowhere as plentiful nor does it tend to dominate pastures.

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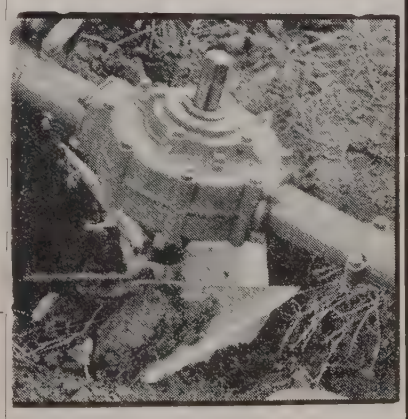

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Ribgrass is undoubtedly the worst of the three weeds. It is a perennial and deep-rooted plant, and the leaves lying close to the ground may occupy a considerable area. It is most plentiful and of most consequence in old pastures in dry but fertile districts. There it gains a footing when the swards open up in the summer, and is on this account aggressive in seed producing districts. Under the conditions of seed production the ribgrass is able to seed freely and to germinate in an opened sward.

The control of ribgrass where it is very plentiful may be carried out only by the plough. In order to discourage its ingress or increase in pastures the density of the sward should be kept as close as possible by the use of permanent strains of grasses and clovers. Occasional hay crops are not as harmful as seed crops.

Ribgrass seed is frequently a source of trouble as an impurity in red clover seed from which it is very difficult to separate, and every endeavour should be made to keep red clover seed production areas free of ribgrass. It is seldom troublesome in root or cereal crops, although it may set up serious competition when early cultivation is neglected or insufficient.

Ragwort (*Senecio jacobaea*).—A very common and now widely distributed perennial plant that has become a source of considerable financial loss in dairying districts, particularly in the North Island.

Ragwort is a perennial plant with an underground root system that enables it to spread in a manner similar to the grass twitches. The plant sets seed freely, some 100,000 seeds being set on an average sized plant. These seeds may be spread by the agency of wind or water, and may also be carried in the wool and hair of animals.

Ragwort is a weed for two reasons. Firstly, it takes charge of country that is capable of carrying a first class pasture with the result that carrying capacity is affected very considerably. Secondly, the plant is poisonous, being responsible for an affection known as "Winton disease." While the effect on cattle and horses is usually serious and often fatal, sheep are able to eat considerable quantities of ragwort before showing any ill effect.

The control of ragwort has been a subject of investigation for many years. Although no easy and completely satisfactory control methods

Ribgrass is a prolific seeder and is a frequent source of trouble as an impurity in red clover seed.

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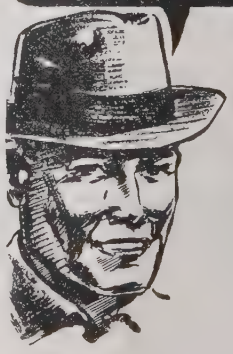

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In the higher rainfall areas ragwort has invaded large areas of potentially good dairying country.

have yet been discovered, two lines of attack give at least reasonably satisfactory results.

1. By Stock: On areas that are badly infested a change over from cattle to sheep grazing usually reduces the ragwort to a negligible quantity. As such a course is not often possible the replacement of a proportion of the cattle beasts by sheep may be carried out. This reduction in the cattle will ultimately give a return in that a higher production per acre will be possible owing to the reduced amount of ragwort.

2. By direct eradication of the plant: Where for various reasons sheep cannot be introduced, mechanical control is the only course left. Many methods, such as mowing before flowering, hand pulling, poisoning and grubbing have been tried out with varying degrees of success. Of these, hand pulling and poisoning, while not completely effective, have given some definite measure of control. Hand pulling has been found to be economic when isolated patches are to be dealt with. The pulling may be carried out when the plant is in flower, and is more satisfactory if the soil is damp, as this enables a larger portion of the plant to be lifted. Experiments have shown that hand pulling gives about 60 per cent. control.

Chemical weed killers such as sodium chlorate have been used extensively for some years, and while there is no doubt that plants have been greatly checked by this method, complete control has not been effected. Nevertheless, on large areas the use of such poisons can still be recommended as no better method has yet been devised.

Rushes (*Juncus spp*).—Rushes are common throughout the country and as a rule thrive under wet and sour conditions.

As is the case with most weeds, control can take the form of either the prevention of the rushes from gaining a hold or the eradication of established plants. Preventative measures

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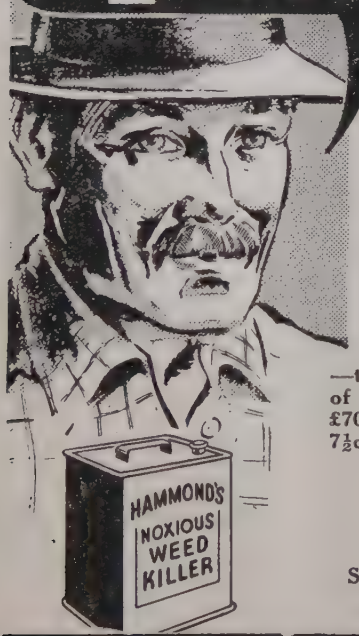

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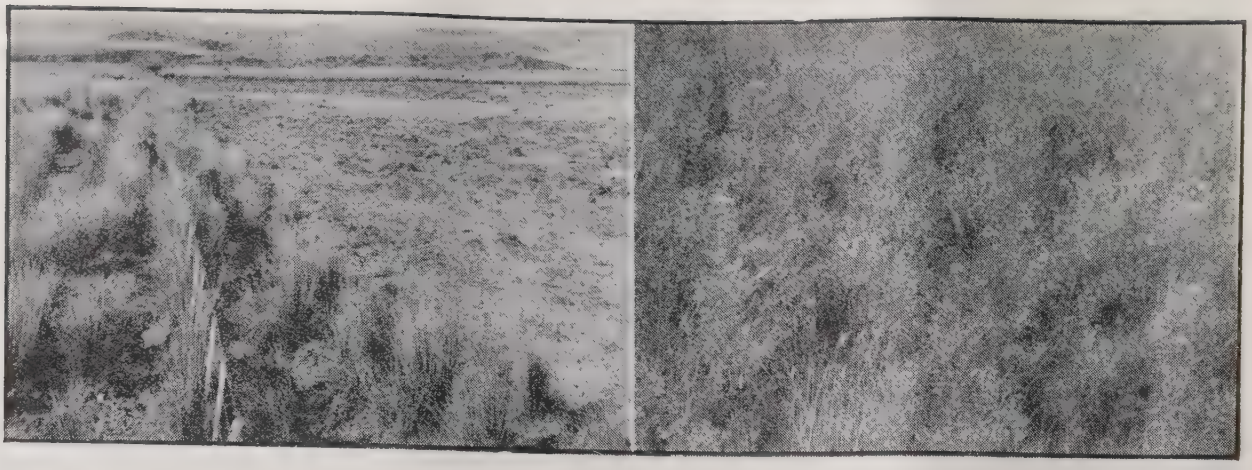

Left.—By ploughing, draining, raising the soil fertility and sowing suitable grasses and clovers rush country may be converted into good dairy or fattening land. *Right.*—On loose friable soils St. John's wort will, if left undisturbed form pure associations and smother out all useful grasses, thus rendering the land virtually worthless for grazing

consist primarily in the draining and liming of the soil. This has two effects, namely, the creation of conditions that are unsuitable for the growth of rushes, and the creation of conditions that are suitable for the good pasture plants. In general, the latter effect is the more important.

The second important factor is the sowing of species of pasture plants that will form a high producing close sward. It is useless to drain, lime and fertilize the soil if short lived species of pasture plants are sown. If the soil is in good condition but has a poor open sward rushes will gain entry very rapidly. The prevention of the ingress of rushes is, therefore, not merely a matter of drainage as is commonly thought.

With regard to the eradication of rushes in an established pasture the hand digging of isolated plants is satisfactory. When a paddock is densely covered with rushes repeated mowings may be effective in eliminating them. If it is possible to improve the drainage this will assist materially in the rapidity of their destruction.

In general, where conditions are suitable for the maintenance of a good ryegrass white clover sward, rushes are seldom very troublesome.

St. John's wort (*Hypericum perforatum*).—This name is very frequently and incorrectly applied to another plant of quite different agricultural significance, namely tutsan.

St. John's wort is a perennial plant which throws up erect, rather slender stems from underground twitch-like runners. The stems reach a height of about 2 feet. The leaves which are oblong in shape are about ¾ inch in length and are covered with many conspicuous transparent dots. The flowers are bright yellow and are borne plentifully towards and at the end of the stems. The above ground portion of the plant dies back each year leaving the brown stems, leaves and seed capsules. St. John's wort spreads by means of its underground runners, and also by means of its small and very freely set seed which are certainly carried considerable distances by stock.

Although St. John's wort is present in many parts of New Zealand it is only in a few localities that it has spread to such an extent that it has become serious.

Similarly to other twitch rooted plants, St. John's wort thrives and spreads most rapidly in warm, loose soils. Consequently it has increased most rapidly in parts of the Canterbury plains and on the fringe of the very dry country in Central Otago. In districts where the soil is loose and friable any odd plants of this weed that might establish should be removed without delay. It is surely better to eradicate odd small patches now than to wait until it has taken charge to such an extent that this becomes both difficult and expensive.

This brings up three important points with regard to the declaration of certain weeds as noxious as defined in the second schedule of the act.

In the first place many of the plants that have been declared by the local authorities as noxious weeds were so plentiful that there was never any real hope of even reasonable control. Consequently the declaration has been virtually meaningless as far as eradication of the particular weed is concerned. Secondly, in not a few instances, local bodies have declared a plant noxious notwithstanding the fact that it was not, nor was it likely to become a menace in their territory. Thirdly, in some districts there are present potentially serious weeds that are listed in the second schedule.

Would it not be more simple and infinitely more satisfactory if known serious weeds were declared noxious as soon as their presence was discovered. It would then be possible to enforce the act strictly and with more than a fair certainty of success. By doing so the local authorities would be doing more good to the community than they would by plodding away in a half-hearted manner with an impossible proposition.

In an endeavour to eliminate St. John's wort various sprays have been tried. Although a degree of control has been obtained, results from spraying have not been sufficiently encouraging to warrant it as a means of elimination.

(To be Continued.)

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Resistance of Beans Against Bacterial-Wilt, Anthracnose, and Bean-Mosaic

By W. D. REID, Senior Plant Bacteriologist, Plant Diseases Division, Department of Scientific and Industrial Research.

Bacterial-wilt, anthracnose and bean-mosaic are three serious diseases of beans, all being present in New Zealand, though the last named has not so far been of major importance in crop production. In this article the symptoms of the diseases and control measures based on New Zealand experience are briefly outlined.

BACTERIAL-WILT is evident as small, greasy, water-soaked spots, ⅛ to ½ of an inch in diameter, on leaves, stems, and pods. The disease causes dwarfing or death of young plants or, because of unsightly lesions, may prohibit use of the green pods. The seeds also can become infected from the pod lesions and later serve to carry infection to the succeeding crop. Young plants from infected seed form numerous stem and leaf lesions which under moist conditions produce masses of bacterial ooze. The plant may die, but the ooze is rapidly distributed to adjacent plants by rain splashes or by insects.

Bacterial-wilt should not be confused with the fungous disease anthracnose, which forms dark brown, sunken lesions on pods and stems and a black discolouration of midribs and veins of leaves. Anthracnose is also seed carried and though in New Zealand normally does not cause as much damage as bacterial-wilt, it occasionally renders a crop unfit for harvesting.

Bean-mosaic is quite distinct from the above and in severe infection is characterised by a dark mottling and distortion of the young leaves. Stunting of plants is common in susceptible lines and pods may be small, reduced in number, or fail to develop. Most crops have a small number of infected plants, but only in a few is the amount sufficient to bring about serious crop loss. This disease is also seed carried and can be transmitted from diseased to healthy plants by rubbing and by insects.

Control Methods

For the control of these and similar diseases the following methods are available:—

1. **Use of disease-free seed.**
2. **Use of sprays and dusts.**
3. **Use of resistant varieties.**

Disease-free seed can be obtained (a) from crops known to be free from disease, (b) by treating the seed in hot water, or (c) by rogueing infected plants from a crop intended for seed. Unfortunately there is no guarantee that commercial seed crops are free from disease. It is possible to grow bean seed in localities where bacterial-wilt does not develop, and this method is used successfully in the United States of America, but in New Zealand seed growers have not found this practicable. The hot water treatment of infected seed has not proved satisfactory, firstly, because the killing point of the organism is close to the killing point of the seed, and secondly, because large seeds such as beans and peas are difficult to treat and dry. Seed treatments with mercurial dusts have not proved of value in controlling bean diseases. Rogueing infected plants when young is a good method for nucleus lines or small areas of crop. Owing to the constant attention and labour required, rogueing has not been adopted for field crops, but for the small grower and home gardener it provides a satisfactory means of maintaining a seed supply free from disease. If rogueing is practised it is necessary to remove all plants within two or three feet of those with lesions, for typical symptoms require approximately one week (after infection) to develop, and there is always the possibility that adjoining plants may be diseased.

Treating the growing plants with sprays has not given control of bean diseases.

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The third method, the use of resistant varieties, has obvious advantages, yet has the serious defect that a variety of special merit for commercial or home use might not be reasonably resistant against one or all diseases. During the last six years forty varieties of beans have been tested at Auckland, and periodically at Palmerston North, for resistance against bacterial-wilt, anthracnose, and bean-mosaic. Included in the trials were a number from England, Holland, Germany, the United States of America, and Australia, reputed to be resistant to bacterial-wilt, but in the present report only varieties obtainable on the New Zealand market are dealt with. This report is taken from a paper to be published in the "Journal of Science and Technology" and the details of layout and methods adopted in the trials will not be given here.

Results of Trials

The results in the table are given as percentage of plants which showed lesions or symptoms of disease. Bean varieties are known by many names and for convenience the synonyms are grouped together, though in the trials many were tested as separate varieties. showed a few lesions. In the table the latter are credited with a "trace." In dwarf varieties the amount of infection on leaves and pods and vigour of the plants ran parallel to number of plants infected. In the runners, however, the above results are misleading for only a few lesions were found on foliage of each plant, the pods were rarely infected, and plants showed no obvious check in vigour. The above observations apply particularly to the records of bacterial-wilt and anthracnose. Giving consideration to the above it is possible to draw some practical conclusions from the trials.

1. All runner varieties have proved resistant to bacterial-wilt, anthracnose, and mosaic.

2. Burnley Selections of Canadian Wonder and Dun have been highly resistant to bacterial-wilt and mosaic but the former has been susceptible to anthracnose.

3. Black Prince, Blue Pod and Woods Centenary, Dun and Zulu King varieties were moderately resistant to the three diseases.

Conclusion

At the present time there is no guarantee that commercial lines of seed are free from disease and in districts where one, or more, diseases are prevalent it is advisable to sow varieties which show reasonable resistance against infection. For the grower of small areas two methods, the use of disease-free seed, or the use of resistant varieties are available to cope with the three diseases.

TABLE.

	Bacterial Wilt Maximum (a)	Bacterial Wilt Avge. (b)	Anthracnose Avge. (b)	Mosaic Maximum (a)
Black Prince, Valentine Black	20	4	9	2
Blue Pod, Blue Wonder, Purple Podded	20	5	Tr.	—
Brown Runner*	20	10	—	—
Burpee's Stringless Greenpod, Stringless Greenpod, Stringless Wonder, Burpee's Stringless	60	20	—	1
Canadian Wonder	100	30	30	Tr.
Canadian Wonder Burnley Selection	10	3	34	Tr.
Case Knife*, Czar, Erecta, White Dutch	60	12	Tr.	—
Epicure*, Everhearing Stringless	—	—	—	—
Felthams Prolific, Abundant, New Discovery	30	8	7	Tr.
G.150*, S. & H.42 (probably Fardenlosa)	Tr.	Tr.	Tr.	—
Hodson's Longpod	50	15	—	—
Keeney's Stringless Refugee, Round Pod, Tendergreen, Thousand-to-one	70	30	20	1
Kentucky Wonder*, Homestead	Tr.	Tr.	—	Tr.
Ne Plus Ultra	40	8	42	Tr.
Pale Dun	20	6	6	1
Pale Dun Burnley Selection	Tr.	Tr.	4	Tr.
Scarlet Runner*, Prizewinner	80	14	—	—
Startler Wax, Startler Golden Wax, Golden Butter, Black Butter, Startler Butter	70	15	35	—
Stayley's Surprise, Bush, The Prince	20	5	55	—
Surecrop Stringless Wax, Prolific Black Wax, Golden Wax, Black Seeded Wax	40	12	20	Tr.
Woods Centenary, Speckled Butter, Golden Wax, Stringless Kidney Wax	20	6	9	2
Zulu King	15	4	Tr.	—

a.—Maximum percentage infection in any season 1937 to 1942.
b.—Average infection for the six seasons.
* Runner varieties.
Tr. = trace, less than 1 per cent.

The above results are based on the numbers of plants infected and do not take into account the numbers of lesions present or the effect on the host. In seasons when disease was not prevalent some varieties, normally infected, were free from disease, and in seasons when disease was general, other varieties which are highly resistant

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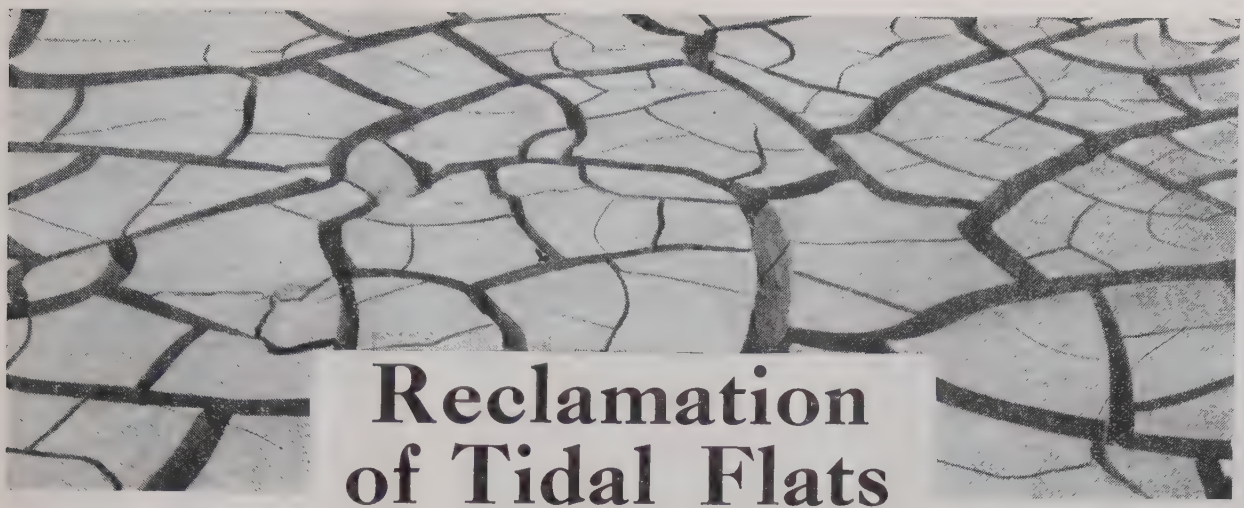

Reclamation of Tidal Flats

Tidal flats need not be useless areas abandoned to a jungle of mangroves. On the contrary, with the expenditure of some energy, and under treatment that is not beyond ordinary farming skill, they can be made highly productive. How it is done is clearly and painstakingly set out in the following article.

— By —
E. B. GLANVILLE,
Acting Fields Superintendent,
Auckland

THE reclaimed tidal flats of New Zealand consist, in the main, of very fertile soils. They form a wide range, varying from sand to sticky clays, and in their natural state the majority of them are covered with mangroves. For general purposes, they can be classed in three broad groups, viz., sands, sandy loams to sandy clay-loams, and sandy clay-loams to sticky clays.

The sands are generally found at a slightly higher level, overlying beds of pipi shells, often quite near the surface. They are very light in texture, dry out rapidly during the summer months, and seldom show signs of cracking, even when thoroughly drained. The sandy loams to sandy clay-loams are heavier in texture, the shell is generally further from the surface, and often they do not overlie shell beds. The soils in this group are generally found at a slightly lower level than the sands; they crack immediately after stopbanking, drain well and can be grassed successfully two or three years after tidal water has been shut off.

The clay loams to sticky clays are found in the low-lying areas. They often over-lie soft, blue-clay mud, and on account of being so wet and low-lying, drainage is a slower process. It generally takes from six to eight years before soils under this group can be brought to a suitable condition for grassing. These soils do not crack until they begin to dry out. The cracking after stopbanking and draining is important, as it assists to remove the excess salt from the surface soil.

Stopbanking

Before any attempt can be made to develop tidal flats, the first necessary operation is to build stopbanks on the edge of the area to be reclaimed, to prevent tide waters gaining further access. The material for building the stopbanks is obtained by digging a ditch inside the bank. The size of this ditch depends on the height to which the stopbank has to be built in order to hold tide-waters back. The ditch serves as the main outlet drain to the flood gates for the reclaimed area. Stopbanks should be built a few feet from the edge of the ditch to prevent

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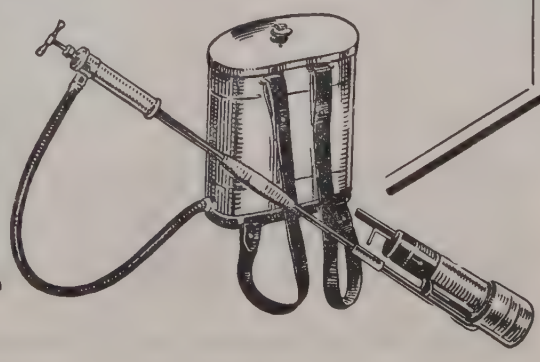

A typical view of tidal flats, showing reclaimed area in foreground. Area outside stopbanking shows natural growth of mangroves in tidal waters.

weight causing the sides of the ditch to slip and block this outlet drain. Stopbanks should have a batter of at least one to one, and in height should not be less than two feet above the highest known spring-tide level. The size, therefore, has to be determined by the height necessary.

Banks with a rise of six to seven feet require to be fifteen feet to eighteen feet wide at the base; this will allow sufficient batter with the top of the bank three feet to four feet wide. The chief difficulty in getting stopbanks to stand is the erosion caused by the tide-lap on banks exposed to the direct action of a wide expanse of water. In places, it is often necessary to protect the banks by facing them with stone or fascines. It is also advisable to plant suitable grasses on the banks for binding purposes. Buffalo grass is quite suitable, but is somewhat slow in covering the banks. Another grass which is used considerably for binding is kikuyu grass. It has much the same growth-habit as buffalo grass, but is more aggressive, spreads faster, and is more palatable to stock. Although it does not seed, there is a decided possibility of it gradually spreading on to the flats, where it would become troublesome and make future cultivation of the land very difficult, if not impossible. Where there is a quantity of shelly material in the stopbank, strawberry clover establishes well. It will grow under salty conditions, and will cover the banks, but has not the same strong-rooting system as buffalo or kikuyu grass. Taking everything into consideration, even although buffalo grass is slow in covering the banks, it is considered to be the most suitable grass for this purpose.

Flood Gates

The ditch, or main drain, which is dug to provide material for the stopbank, is provided with outlets through the stopbanks, which are fitted with flood-gates in order to stop effectively the inflow of water from incoming tides and to let drainage water out when the tides recede. The outlets through the stopbanks should be concreted and provided with hinged flood-

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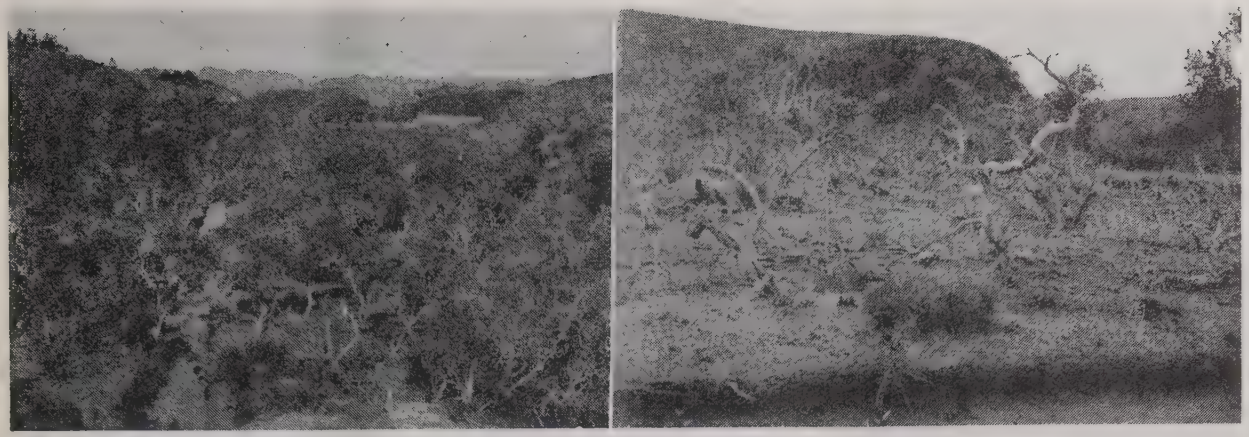

Left: Another view showing strong growth of large mangrove trees on unreclaimed area. *Right:* Mangrove trees dying after drainage of reclaimed area is becoming effective.

gates fitted close into the concrete, so that they become water-tight with the pressure of incoming tide waters. Concrete pipes, one foot to two feet in diameter (or larger if required), cemented at the joints, and set in a concrete bed, are suitable for outlets through the stopbank. Wing-walls for about four to five feet on each side are also required on both sides of the outlet to prevent erosion from the flow of water. A fluming is also required at the outlet for about twenty feet to carry the water into the tide, otherwise a large hole will form in the tidal side of the outlet, which ultimately will undermine the bank and cause it to slip away. Concrete flood-gates are preferable to wooden ones, as the latter become warped owing to one side being wet and the other side dry. Flood-gates are constructed at the lowest level to provide outlets for the main drains, into which the internal drains flow, and they should be sufficient in number and size to carry drainage water away quickly between tides.

Flood Pumps

Where the reclaimed area is almost level with the outside water at low, or partly low, tides, drainage through flood-gates is not very satisfactory. Where this occurs other means have to be resorted to to remove drainage water collected by the internal drainage system; and the only satisfactory method of removing this water is with flood-pumps. Even where flood-pumps are used, it is generally advisable to provide flood-gates, as a certain amount of drainage water will escape from the reclaimed area at low tide. This would allow for more economical use of the pumps, which would be in motion only when the tide-waters prevented the escape of drainage water through the flood-gates.

It is very important for the successful development of reclaimed tidal areas that provision be made for drainage water to be removed as quickly as possible. It the area is at a reasonably high level, this can be achieved by the use of flood-gates, but if all drainage water cannot escape through the flood-gates between tides, it is then necessary to remove this water by flood-pumps. It will, therefore, be realised that it is very necessary to have a survey taken of levels of the area to be reclaimed before work is commenced, so that data is available which will indicate whether flood-gates can be constructed at a level which will adequately allow drainage water to escape through them when the tide recedes, or whether it is necessary to instal flood-pumps to lift surplus drainage water over the stop-bank into the tide.

Large stopbank and drain on large reclamation. Stopbank has been constructed with material from drain by means of a grab dredge. Note protective covering of strong growth of buffalo grass and pampas grass on stopbank.

A stopbank of considerable age showing main drain inside bank and step between edge of drain and stopbank. Note strong protective growth of buffalo grass growing on bank.

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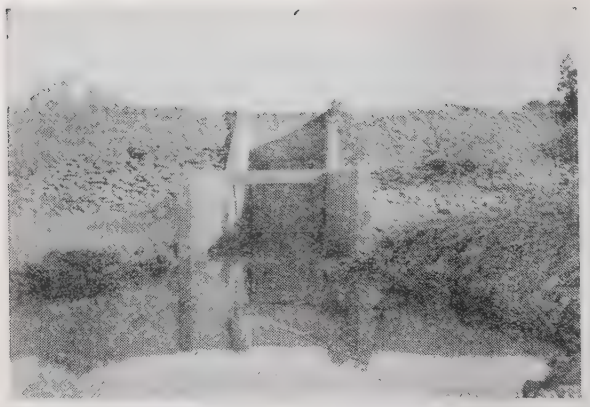


View of same flood-gate from reclaimed side. Wing wall also necessary on this side to protect stopbank from eroding by large volume of water held back in main outlet drain by rising tide. Buffalo grass well established binding and protecting stopbank on reclaimed or dry side.

Outside view of large concrete flood-gate with hinged wooden gate; also shows strongly constructed wing walls. Note measure taken by paving bank with stones to protect outside of stopbank from erosion through tide lap.

The use of flood pumps for removing drainage water from farm lands has been dealt with previously in this journal. In the September issue, 1935, Mr. J. E. Bell, then Instructor in Agriculture, Auckland, dealt fully with this matter, and more recently Mr. E. H. Arnold, Instructor in Agriculture, Dargaville, prepared an article on this subject, which was published in the November issue, 1942. Information regarding types of pumps for this particular work, and costs of operation, are fully set out in these articles.

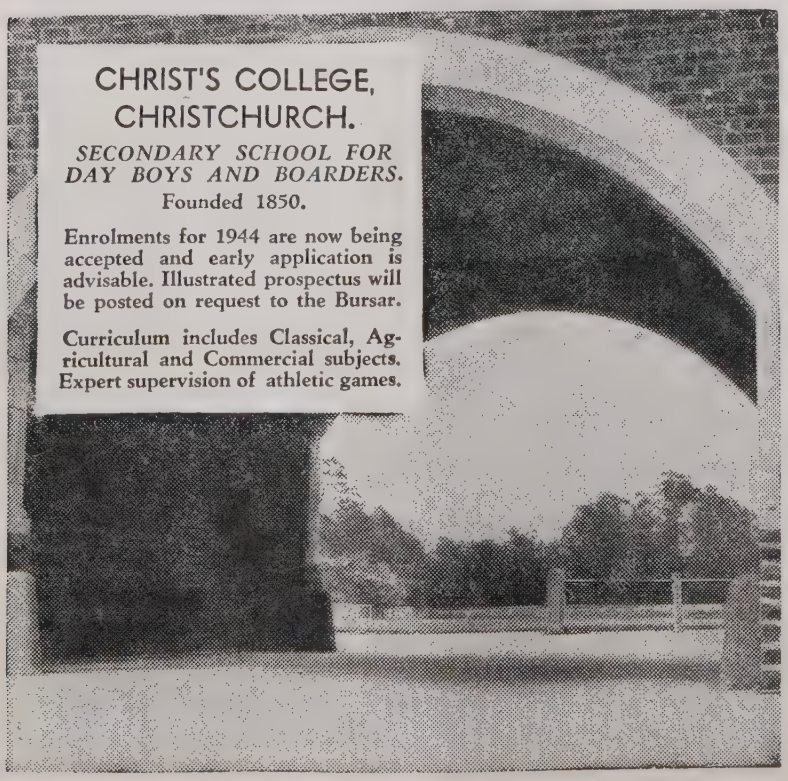
Internal Drainage

Internal drainage on reclaimed tidal areas is essential to bring the soil into a state fit for grassing.

The percentage of salt in the soil must be reduced before grasses and clovers will grow satisfactorily. This process is more rapidly achieved by thorough underground drainage. If the soil cracks freely after stopbanking, open drains every five to six chains to a depth of two feet six inches to three feet are usually sufficient to carry off the water. In sands and sandy loams overlying shell, open drains every chain to a depth of two feet to two feet six inches will serve the purpose of eliminating salt rapidly, but the drains are much more effective if fascines are used and the drains put in two chains apart at a depth of two feet six inches to three feet deep. The sticky-clay types are the most difficult to drain and deal with generally. Stock should not be allowed on stop-banks. Open drains one chain apart should be put in to a depth of two feet six inches and, if possible, converted to fascine drains. Rushes and sedges usually come in on these types some time before they are ready to grass. The drains should be acting well for at least two to three years before an attempt is made to sow grass.

Time Required

The period which must elapse from the time the sea-water is shut off until a reclaimed tidal-area is ready to be successfully sown to permanent pasture varies considerably with the type of soil and subsoil dealt with. After years of submersion by sea-water, the soil becomes saturated with salt. It may take two to ten years, or more, before the percentage of salt is reduced sufficiently for pasture grass and clovers to establish satisfactorily. While there is a large percentage of sodium salts in the soil, the clay types, particularly those with little or no shell near the surface, remain sticky.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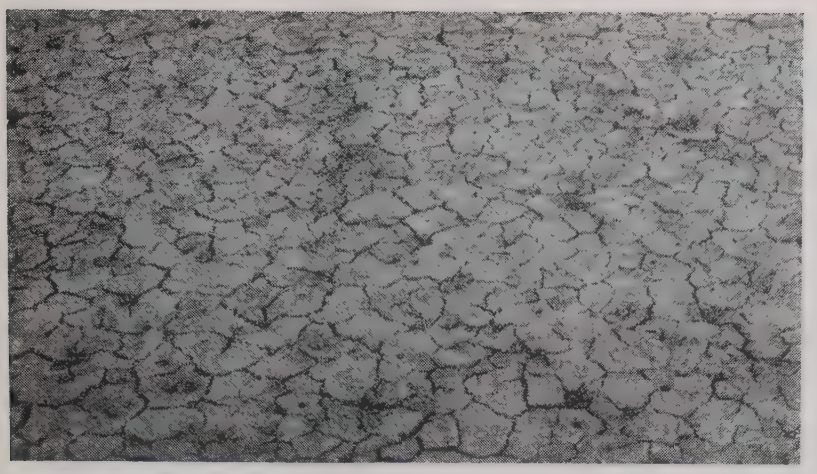

Illustration of cracking which takes place on sandy loam areas after tide water has been shut off by stopbanking. These areas are easy to drain and are in a condition for grassing 2-3 years after stopbanking.

Ploughing or cultivating them too early may do a great deal of harm in rendering these types unsuitable for the growth of plants, other than rushes and sedges. All types overlying shell beds are easily dealt with, and may be made ready by thorough drainage to carry permanent grass and clover within two or three years after stopbanking. Sandy loam to sandy clay-loam types which crack freely after stopbanking require least drainage, and are soon ready for grass. Sands with no shell which do not crack, and sticky-clay types which take a considerably longer time to drain efficiently, are the slowest to come in. A thorough internal, underground drainage system working satisfactorily is essential before any attempt can be made to prepare these types for permanent grass.

Indicator Plants

As the drainage on reclaimed tidal flats begins to take effect, and the soil becomes sweeter through the percentage of salt decreasing, two plants, known as sea aster (*Aster subulatus*) and Fleabane (*Erigeron canadensis*), commence to establish. They are known as indicator plants, and they act in the capacity of a soil chemist. When they start to come in and grow on reclaimed areas it is an indication that the soil is becoming sweeter through the salt-content diminishing.

Illustration of severe cracking which takes place on the heavy clay areas when they begin to dry out. These areas are difficult to cultivate and are not in a condition for grassing until 8-10 years after stopbanking and drainage by an underground system.

General view of reclaimed area, showing open drains 2 chains apart. When the area begins to dry out these drains will be converted into underground ti-tree fascine drains.

Sea Aster (*Aster subulatus*) is the first indicator plant which makes its appearance. It is an annual with quite smooth stems and leaves free from hairs. The plant seldom reaches more than three feet in height. The lower leaves may be up to eight inches long and threequarters of an inch wide, slightly fleshy and smooth to the touch, becoming thin when dry. The margins of the leaves may be somewhat wavy, but lack distinct teeth. The upper leaves are shorter and very narrow, widest near the bases. The branched inflorescence is more spreading and open than that of fleabane. The flower heads are purplish in the centre, and the white rays are usually more distinct than in the fleabane. Sea Aster will rapidly become general over the reclaimed area as soon as the salt content of the surface soil is slightly reduced. This plant definitely indicates that the salt is commencing to go from the soil, but it is not in a fit condition to prepare for permanent pasture until Fleabane (*Erigeron canadensis*) commences growth and begins to replace sea aster.

Fleabane (*Erigeron canadensis*) is an annual, with erect, rather wand-like, finely grooved, bristly-hairy stems. On good soil it may reach a height of ten feet, but on poor soil may flower when only a few inches high. When cut, it stools freely, assuming a bushy habit. The lower leaves are about three inches long and up to three-quarters of an inch wide, the widest part being above the middle. They are rough to the touch, owing to the bristle-like hairs, and usually show several distinct, distant teeth along the margins. The upper leaves are much narrower, usually lacking teeth, and produced in abun-

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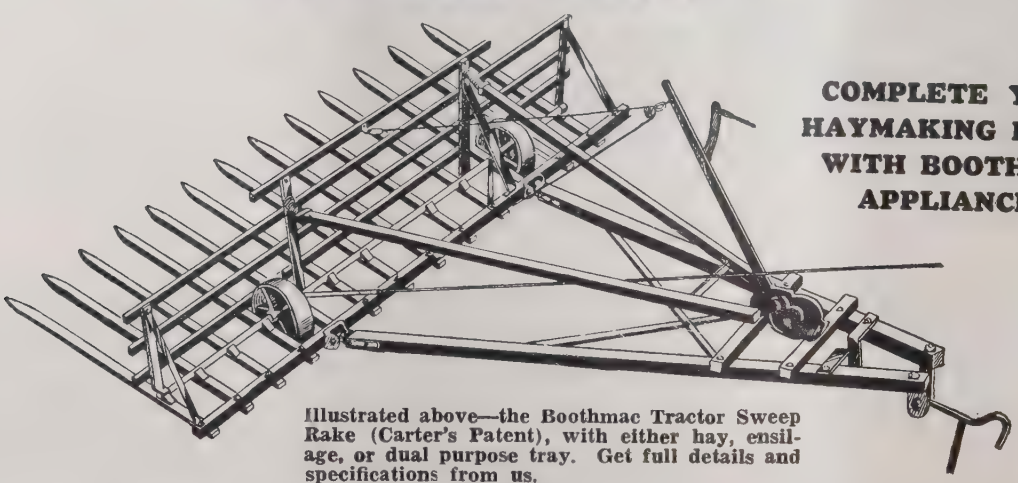

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Left: Open drain in sandy loam overlying a bed of shell. Drainage becoming effective as indicated by Fleabane *(Erigeron canadensis)* rapidly taking charge. *Right:* Open drain dug at same time, but in a clayey soil type. Drainage much slower, small mangrove plants still existing, while "indicator" plants such as sea aster *(Aster subulatus)* and Fleabane *(Erigeron canadensis)* have not commenced to establish. Note absence of shell in subsoil.

dance. The flower-heads are very small and numerous, more or less clustered on branching stems from among the upper leaves. Small white rays in the flowers can be seen only on very close inspection. Fleabane is often known as horse-weed, butter-weed, fire-weed, or bitter-weed, but is generally known as Fleabane. It is rejected by stock, and is to be classed as a harmless weed. The leaves are bitter and the plant is objectionable if occurring in any quantity of hay. On reclaimed areas in the process of sweetening, it grows on the higher parts, and does not invade the flats till the salt content has considerably decreased. As the sweetening process proceeds fleabane comes in first along the edges of drains, on drain banks and stopbanks, and gradually invades the lower areas. Fleabane does not become general until the land is well enough drained and free from salt to take grass well. When the area reclaimed reaches this stage, and fleabane has practically taken charge, preparation may commence for sowing permanent grass, but it is a mistake to make any attempts at grassing until this stage is reached.

Photo of "Indicator" plants, Sea Aster and Fleabane. *Left:* Inflorescence of Fleabane. *Right:* Inflorescence of Sea Aster.

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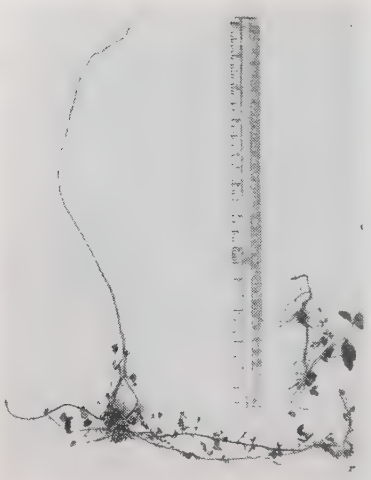
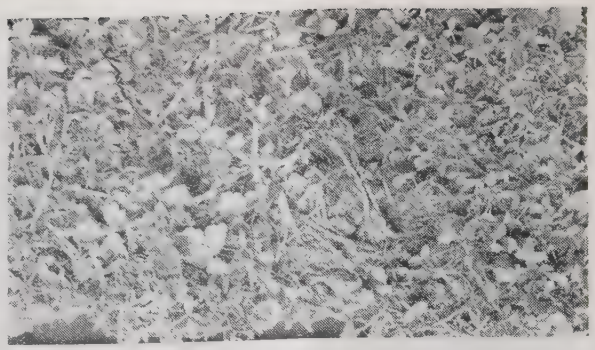


Strawberry clover, the pioneer plant for pasture establishment on reclaimed tidal flats. *Right:* A plant of strawberry clover. *Left:* A plant of white clover for comparison. Note strong, deep rooting system of strawberry clover and short roots of white clover, from the stolon.

Cultivation

Considerable areas of reclaimed flats have been grassed satisfactorily after surface cultivation. This applies especially to soil types which come under the heading of sand and sandy-loams. Even although fairly successful pasture can be established after this type of cultivation, better results are obtained after ploughing and a fallow before sowing. Ploughing should be done during the late autumn, before the land becomes wet, and the furrow slices should be broken down roughly. If the land is left in this condition through the winter, the rains will assist to wash out more salt to the lower layers or into the drainage system. It is generally not necessary to plough a second time, but the land should be constantly worked with a cultivator and penetrating harrows during the summer. This sweetens the soil considerably, and allows of adequate aeration while a good seed-bed is being prepared which will be consolidated from the bottom up. The seed-bed should be ready for sowing during late February, and one stroke of the Cambridge roller just prior to sowing the seed should be sufficient. Clay-soil types cannot be handled satisfactorily without ploughing on account of rushes, and they should be subjected to thorough summer cultivation before sowing to grass. It is necessary, on the clay types, to clear the mangrove trees before any progress can be made with ploughing and cultivation. If mangroves are present, they rapidly die when the sea water is shut off the area, but they entail a considerable amount of work in clearing where the trees are large. Stumping is often necessary to prepare the land for ploughing.



Strawberry clover making strong establishment on depleted reclaimed land amongst a weed growth of buttercup.

Grassing

Where the drainage is efficient, and the cultivation is thorough, no difficulty is experienced in establishing a high-producing sward of perennial rye grass and clovers. Strawberry clover does well on reclaimed flats. It will establish before other types, and should be sown in all mixtures. White clover establishes soon after strawberry, but is checked considerably during the summer months, when reclaimed tidal flats become very dry. Perennial ryegrass will only thrive when the clovers have made good establishment and are thriving. Paspalum, although slow to establish, does well when established, and forms a good combination with perennial rye, white and strawberry clovers. Italian rye, alsyke, and red clover can be used, but they form only temporary elements. A mixture which has proved satisfactory on well-drained reclaimed areas, consists of—

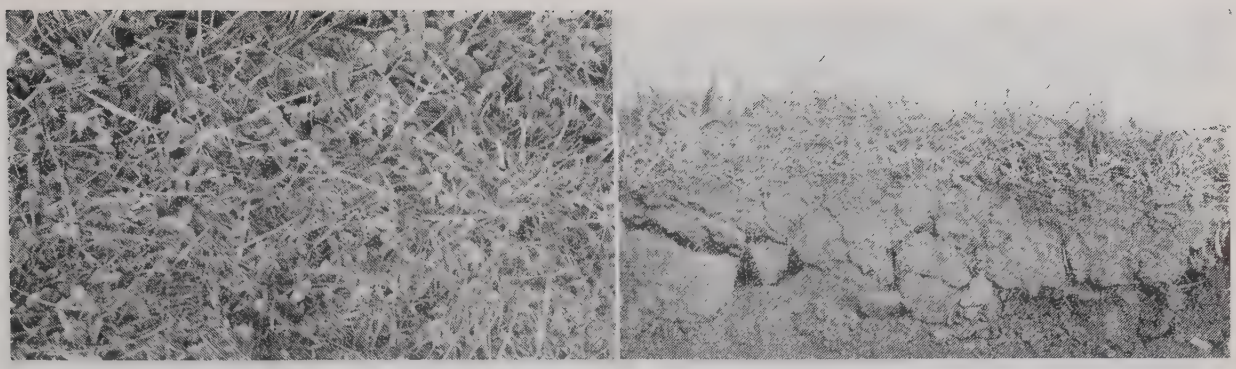
Perennial ryegrass (certified)	25	lb.	per acre.
Paspalum (Australian)	5	„	„ „
White clover (certified)	2	„	„ „
Strawberry clover	2	„	„ „
Red clover	3	„	„ „
	37	„	„ „

Note: Paspalum is included for North Auckland, but further south, where climatic conditions are cold, it should be deleted.

Strawberry clover (*Trifolium fragiferum*) has proved a very valuable plant for establishing pastures on reclaimed tidal flats. Without strawberry clover it is practically impossible to obtain successful pasture establishment on soils such as are found on tidal flats. It is a perennial plant, and is like white clover in its habit of growth, spreading over the ground by means of stolons. Like white clover, the stolons strike roots at the nodes, but it differs from white clover in that it has a very deep rooting system; its roots will penetrate up to two feet into the soil. This deep rooting system explains why strawberry clover grows so successfully and produces highly through the summer months on soils such as these, which dry out so rapidly during hot summer weather.

The leaflets of strawberry clover are hairless, and similar in appearance to those of white clover, only they are a true oval, instead of being heart-shaped or narrower at the base as compared with the leaflets of white clover. The flower is very similar to the white clover flower, but the petals usually have a pinkish tinge. Later it forms a strawberry-like seedhead from which it receives its name. Strawberry clover establishes best in damp situations. Although it will exist under very wet conditions, it grows best where the drainage is good. It will exist in drier, or more salty, and in wetter conditions, than white clover, but it demands high fertility for **vigorous growth.** In the winter, and in wet summers, it grows less vigorously than white clover. In dry summers, when white clover ceases to grow, strawberry clover produces abundantly. Without clover,

Strawberry clover establishing on practically bare ground. Note dead stalks of pennyroyal on the invaded territory.



Left: An example of the type of high producing pasture which is obtained on reclaimed tidal flats consisting of ryegrass and strawberry clover. *Right:* A side view, showing the dense sward of ryegrass and strawberry clover. Note the strong root growth of strawberry clover.

perennial ryegrass will not thrive. A good clover establishment in laying permanent pastures is the secret of success. In strawberry clover we have the pioneer plant which paves the way for other high-producing grasses to grow on a soil type where it is difficult for other clovers to establish. As strawberry clover establishes, perennial ryegrass commences to grow through it, and the pasture sward becomes a ryegrass-strawberry clover one. Such a pasture is capable of high butterfat production per acre, the ryegrass producing most of the feed in the autumn, winter and spring, while the strawberry clover maintains production during the summer. In areas where climatic conditions are suitable for paspalum, strawberry clover greatly assists this grass to make the sward a better producing one, especially during the summer.

A view of a farm on reclaimed tidal flats brought into permanent pasture with the aid of drainage and strawberry clover, carrying a herd of dairy cows.

Fertilisers

Soils on reclaimed tidal flats are very fertile, and manurial trials conducted on them have given little information. The most promising results have been obtained from superphosphate, basic slag, and potash. When in good condition, the land produces a strong growth of clover which causes a considerable amount of bloat in dairy stock. Topdressing with phosphates or potash only increases this trouble by producing more clover when a response is given. It is the practice of many who are farming these areas to use a topdressing such as ammoniated superphosphate, or sulphate of ammonia, to encourage a stronger growth of ryegrass. It appears advisable to dress the land with a light dressing of phosphate at the time of sowing, and on the sticky clay-soil types it would be an advantage to use, in addition to phosphate, ground limestone at 5cwt. per acre to assist the rapid establishment of strawberry and white clover. Subsequent topdressing depends entirely on the sward established. If the sward does not develop into a high-producing one without topdressing, it is necessary to build up the fertility with phosphates, and perhaps lime or potash in addition.

Crops

These soils grow good crops of mangolds, turnips and maize, but unless a normal season is experienced the crops are grown with difficulty. The soil is difficult to cultivate, and if wet weather is experienced, it becomes very heavy and soft. Attempts have been made to grow lucerne, but few successful stands have been established, as the winter conditions are generally too wet for the production of good crops. Maize can be grown successfully, and the grain is valuable for pig and poultry feed. With the prolific summer growth of pasture, adequate supplies of hay and ensilage can be saved, and farmers on these areas are inclined to rely on all grass-farming, using the hay and ensilage during periods of lean grass growth, rather than face the difficult cultivation necessary to produce good crops.

Orchard Diseases

FULL information on the subject of sprays for the control of orchard diseases and pests is available in a **free** bulletin (No. 161) obtainable from the Department of Agriculture at Auckland, Wellington, Christchurch and Dunedin.

A view of an area of approximately 100 acres being used for dairy farming. Production per acre is between 150 and 200 lb. of butterfat.

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McCormick-Deering, who have for years set the standard for farm machinery, are at it again. This time it's a mower—the sweetest, smoothest-running mower ever hitched to a horse. It's the McCormick-Deering No. 9 with the new Zerol Bevel gears—a completely different transmission that's been proved by field tests as the most efficient yet. Arranged to give a "two-step" gear reduction, Zerol gears are two sets of highest grade steel with distinctive curved teeth that slide into each other easily, quietly, then grip firmly near the centre, where they're strongest. It means no wear at the ends and edges, means perfect contact, perfect transmission, even after long years of service.

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Conservation of Farm Machinery

The Care and Maintenance of Binders

The proper care and maintenance of farm machinery cannot be stressed too strongly. This timely article on the binder has been prepared by the National Institute of Agricultural Engineering, York, England, and appeared in the Journal of the British Ministry of Agriculture. Farmers are urged to put into practice the advice and instructions given in this article.

THERE are over one hundred lubrication points on a modern tractor binder. Grease all round first thing in the morning and once again during the day; but, on a long day, lubricate fast moving parts three times. Start at one point and work systematically round the machine so that no parts are missed. Where oil-baths are fitted see that the oil is maintained at the proper level with the correct grade of oil; used sump oil must not be used for binder lubrication. Chains should not be lubricated in very dusty conditions, especially where the soil is of a "cutting" nature.

Canvases

Check over all canvases before harvest and attend to any necessary repairs at once. When putting canvases on see that they run **buckles first,** and that the flaps are well laced down. Make sure that all straps are tightened evenly, or the canvas will creep towards the tight side. Do not run canvases too tight; run them tight enough to drive without putting undue strain on the rollers. If, after the above points have been followed, a canvas still does not run true, check the rollers to see that they are parallel. This is done by measuring diagonally from the left-hand edge of one roller to the right-hand edge of the other, and vice versa. These two measurements should be the same. If they are not, adjustment can be made by lengthening or shortening the cross members that brace the frame carrying the canvas.

Chains and Gears

Be sure that all chains are fitted to run the right way round (see Fig. 1). With a roller chain, the clip holding the joining link should be fitted as shown in Fig. 2.

Do not run chains too tight; they should be slightly slack, but not so

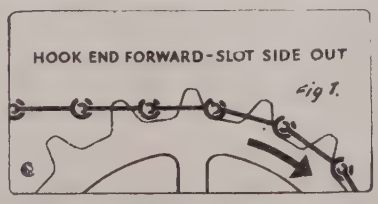


Fig 1.

slack that the chain can flap against a part of the machine or jump a tooth on the sprocket. If chains keep coming off, and the tension is correct, make sure that all the sprockets are in line. Keep all gears free from rubbish. An accumulation of dirt straw and similar material between the teeth may prevent them from meshing correctly. When properly adjusted there should be just a little play or "back-lash" in the gears. (This should be checked in a number of places by turning the gears round a little at a time.)

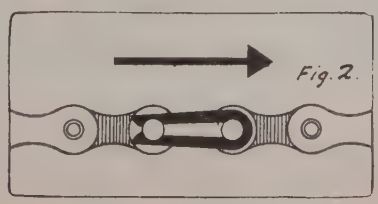


Fig. 2.

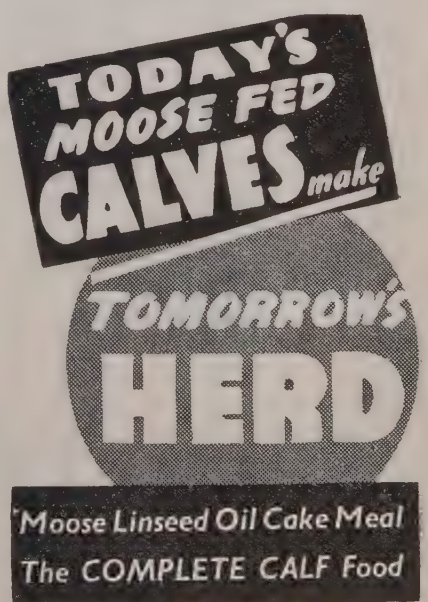
Cutter Bar and Knife

Note that each section centres on every other finger (6-in. travel), whereas a mower knife section centres on each finger (3-in. travel). The general condition of this part of a binder is not so vital as is the case with similar parts in a mower; but the following points should be noted:

(a) All rivets should be kept tight, especially on the knife head. Where a rivet has become slack in its hole, fit a new one.

(b) See that all the knife sections and fingers are in line. Any that are not can be adjusted carefully with a hammer.

(c) The clips should hold the knife firmly on the ledger plates; but do not tap them down too far so that they bind.



Yes, blood will tell—and in more ways than one. In every combat zone life saving blood is bringing swift healing to wounded and exhausted troops. A vast organisation is at work rushing vital blood plasma to stricken men—and Frigidaire is a "key" factor in that organization. Cold-storage Cabinets at Blood-Donor Centres, Processing Laboratories, Refrigerated Shipping Containers, Blood Banks, Plasma Storage Cabinets and Mobile Blood Transfusion Units, are but some of the equipment the provision of which is one of Frigidaire's wartime jobs.

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(d) Excessive wear, usually found on the older wooden pitman bearings, will cause loss of motion, and the sections will not centre on the appropriate fingers.

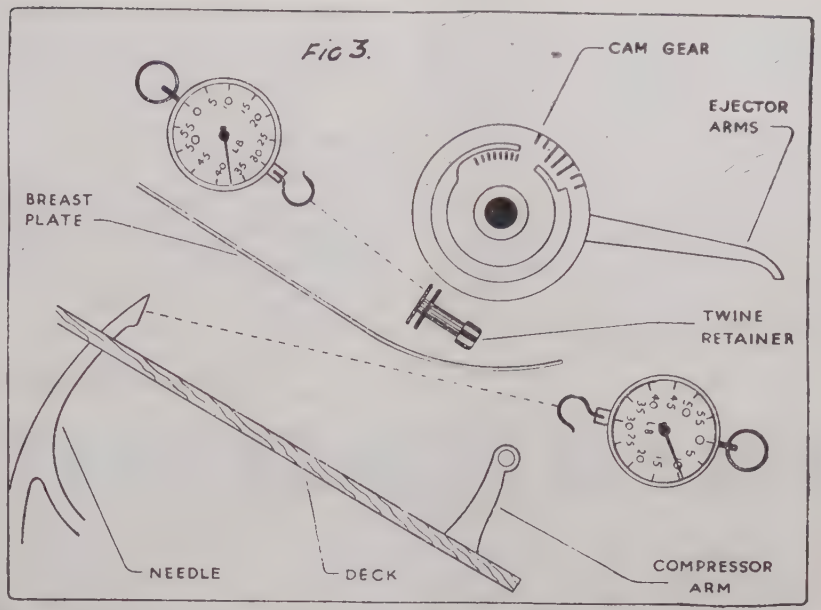
(e) Lubricate the pitman bearings thoroughly; but *do not* oil the cutter bar or knife where grit can get on them.

(f) Never use a blunt knife, especially when there is any quantity of greenstuff in the bottom of the crop.

Twine Tension and Knife

Twine tension is most important for the correct operation of the knotter, and should be checked with an ordinary spring balance as shown in Fig. 3.

Do not use tensions greater than those shown in the diagram, as the twine may break or become unthreaded, and strain is imposed on the knotter, leading to sheaves being discharged untied. Before the beginning of a season's work the twine knife should be removed and sharpened with a carborundum stone.



During Use

If satisfactory work is to be done there must be an operator on the binder, unless it is fitted with levers within the tractor driver's reach. Do not work a binder too fast, especially over rough ground. About 3-4 m.p.h. should be the absolute maximum on level ground, using pneumatic tyres; but the tractor should be throttled down before crossing furrows, etc. **More binders are shaken to pieces behind tractors than are worn out in normal work.** If any stoppage occurs during work, back before restarting, so that the machine can gather speed before entering the crop.

Never let the fingers dig into the ground; this is likely to occur when there is a ridge in the land between the main wheel and the outside divider, or when crossing furrows. To get the required length of stubble, set the height of the binder on the main wheel and outside divider wheel, using the tilting lever mainly to make adjustments for unevenness in the land.

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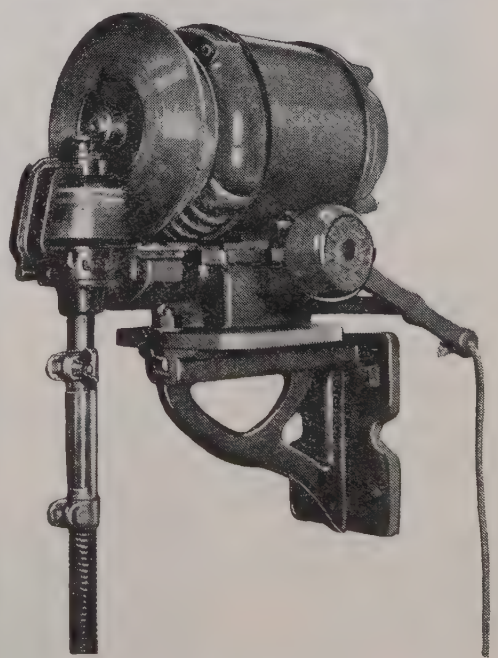

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In a heavy crop the ears tend to go up the elevator before the butts, so lower the machine and tilt up the front to retard the ears. On some makes of binder there is a strap of metal provided to run over the platform canvas, and this should be used to serve the same purpose. In a laid or tangled crop neater sheaves can often be made by frequent adjustments of the reel—both backwards and forwards, as well as up and down. Care should be exercised in doing this, to ensure that the crop is not thrown over the back of the platform. Where there is a great deal of greenstuff in the bottom of the crop it is better to leave longer stubble, so that the sheaves dry out more easily.

Powershafts

When hitching a tractor to a power-driven binder, the powershaft should run, as nearly as possible, in a straight line, parallel to the direction of travel. Guards should **always** be used to prevent straw from winding round the shaft, as well as to reduce the danger of accidents.

It is very important to make sure that all bearings, particularly universal joint bearings, on a powershaft receive frequent and thorough greasing. Safety clutches should **never** be tightened down so that they cannot slip. If a clutch starts to slip after a long period of normal work, it is due to some trouble in the binder which should be found and corrected. The clutch should not be tightened without such an investigation.

Tying Sheaves

While at work constant attention should be paid to the binding lever to

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ensure that the sheaves are tied as near the middle as possible. Any variation from the centre should tend towards the butts, rather than towards the ears. This applies particularly to winter oats, which tend to slip out of the bands if tied nearer the ears than the butts. The binding lever should be used to adjust the tying position of the sheaf; the buttor should not be used for this purpose, except in very short crops.

Varying Sheaf Size

Where the trip and compressor arm are separate, the size of the sheaf should be varied by adjusting the positions of the compressor arm and trip lever, and **not** by increasing the trip spring tensions.

Where the trip and compressor are in one, slight variation in the tension

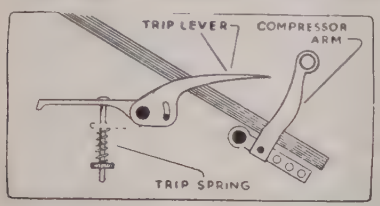

Fig. 4.—*For a small sheaf:* Set the compressor arm "in" and the trip lever "up."

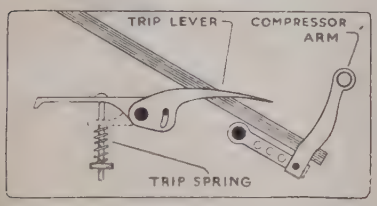

Fig. 5.—*For a large sheaf:* Set the compressor arm "out" and the trip lever "down."

of the trip spring will be needed in addition to the adjustment of the position of the compressor arm.

For a small sheaf: Move the compressor arm in and decrease the tension of the trip spring.

For a large sheaf: Move the compressor arm out and increase the tension of the trip spring.

Varying Band Tension

Variation in band tension is effected by adjusting the trip spring tension; **on no account by variation of the twine tension.**

For a tight sheaf: Increase the trip spring tension.

For a loose sheaf: Decrease the trip spring tension.

Knotter Troubles

If a new machine throws occasional untied sheaves there is no need to make adjustments at once. After half a day's work, when paint and general stiffness have worn off, the trouble will probably have ceased. Normally, if untied sheaves occur, it may be due to a weak place in the twine, rust on the knotter, a grain of corn in the bills, or rubbish temporarily blocking the knotter. In addition, a blunt twine knife can give rise to a number of troubles. **No adjustment should be made to the knotter itself,** until it is clear, by the frequent recurrence of some trouble, that the knotter is really at fault.

Before investigating knotter troubles the following points should be grasped:

The operation of any knotter depends on correct timing (timing marks are provided on all gears for correct assembly).

(a) The needle is timed to deliver the twine into the twine retainer at the correct time.

Pigs

THE basis of success in pig production is management. The object of the Department's **free bulletin,** "Modern Methods of Pig Production," is to provide some of the essential information necessary to successful management. If you have not a copy of this bulletin send for one today.

It reduces harvesting costs because of its speed and efficiency. It is easily fitted to any type of car or truck, and cuts out the necessity of raking. War-time conditions demand efficiency, particularly with the present labour problem, and the MORRISON AUTO-LIFTING SWEEP made in 7ft. and 8ft. sizes, is the economical answer for these trying times.

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(b) **The twine retainer is timed to move on to grip the twine as soon as the needle lays it in the proper groove.**

(c) **The knotter bills are timed to turn when the twine retainer has gripped the twine.**

(d) **The bills are timed to open and close, to grip the twine, when it has been wrapped round them by their own rotation.**

(e) **The knife is timed to cut the twine while it is being held by the bills.**

(f) **Finally, the stripper and discharge arms are timed to pull the finished knot off the bills, so drawing it tight.**

If any one movement in this sequence of events is interrupted by wear, damage, or faulty adjustment, the knotting mechanism will fail to tie the sheaf properly. It is important, therefore, that this sequence should be observed by turning the knotting mechanism slowly (by hand) in order that faults may be traced.

If this fails to reveal the fault the binder should be put to work and stopped immediately an untied sheaf is thrown; then, by finding the band and examining the ends, the fault may be traced in the following way:

In this case a slip knot is tied round the sheaf, and the free end of the twine runs back to the needle.

This is due to the twine not being placed in the retainer by the needle for any of the following reasons:

(a) **The needle was timed too late, so that the twine retainer had moved before the twine was there to be gripped.**

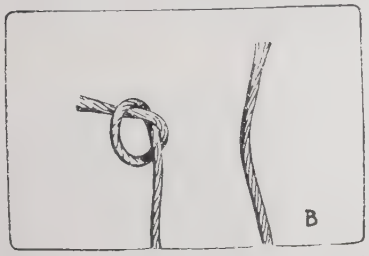
(b) **The needle was bent and did not put the twine in the correct place.**

(c) **Greenstuff or other rubbish blocked the twine retainer or needle, so preventing entry of the twine.**

The remedy lies in clearing away any rubbish if present, or adjusting the needle in one of two ways:

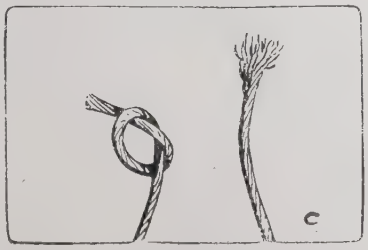
(i) **See that the needle moves as far as possible into the mechanism without fouling anything; that is, have the needle "timed early." This is done by shortening the needle pitman, half a turn at a time, until the desired position is reached.**

(ii) **If the needle does not place the twine centrally in the notch of the twine retainer, the needle itself may be bent until it does so. (It is a malleable casting).**



Here the twine retainer is too loose, and one end of the band has been pulled from it before the knot was formed.

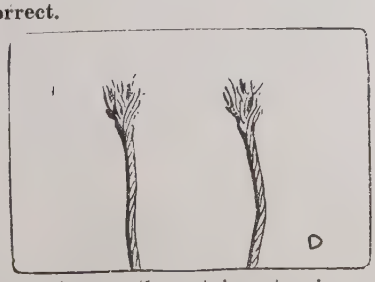
Tighten the retainer tension a **little at a time** until the trouble stops.



Here the twine retainer is too tight, and has "chewed" one end of the band in two before the bills made the knot.

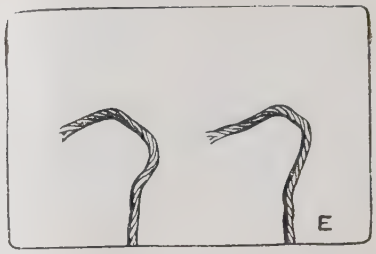
Slacken the retainer tension until normal bands are formed, and check the twine tension on the retainer as shown in Fig. 3.

When slip knots of the type (B) and (C) above are found on the bills the twine tension is **too great:** when found with the sheaf the twine tension is **correct.**



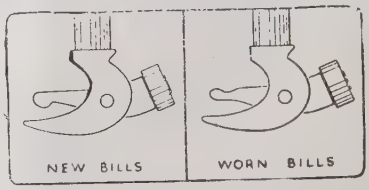
In this case the retainer tension was so great that both ends were "chewed off" before the knot was formed. This is often caused by excessive tightening of the retainer tension in correcting fault (B), above.

Slacken the retainer tension.



Here both ends show signs of bending, as a knot had been formed and had come undone. This is due to the tension on the knotter bills being too slack, and allowing the knot to slip out before being completed.

Tighten the bill tension a **little at a time** until the trouble is corrected.



The same trouble may also be due to the knob on the end of the upper bill hook becoming worn, and allowing the twine to slip out.

Fit a new hook or complete bills if they are badly worn.

If the binder casts a number of small sheaves, or sheaves of irregular size, it is a sign that the tying mechanism is not waiting, on the completion of a sheaf, until it is tripped for the next one; but carrying straight on without a pause. This is due to a fault in the locking and actuating mechanism situated at the front of the binding deck. It may occur because of any of the following reasons, and the remedy is usually the fitting of new parts:

(a) **Worn trip dog and stop (old ones may be ground into shape if not too badly worn).**

(b) **A broken dog spring.**

(c) **Worn rollers, etc., on the packer drive.**

After Work

A binder should never be left after a day's work unless covered with a sheet; usually it will be found necessary to use a few sheaves to ensure

S. OPPENHEIMER & CO., INC.
(Incorporated in U.S.A. as a Limited Liability Company)
Established 1868 in New York, 1892 in New Zealand.
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that rain does not drive under the sheet. If a binder is left overnight, or for a similar period, the canvases must be slackened.

Travelling

When any long distance has to be covered always pack up the binder for travelling. Pull the reel back as far as it will go and turn it, if necessary, to ensure that no arms project beyond the general line of the machine; if any do, they should be removed. Unless pneumatic travelling wheels are provided, do not haul at high speeds on roads or rough surfaces. Great care should be exercised in passing through gateways.

Do not load the platform with a heavy weight of string, fuel or spare parts; this leads to distortion of the platform and damage to the canvas. Nothing should be placed on the platform unless the canvas is removed beforehand; it is not sufficient just to slacken it.

Storage

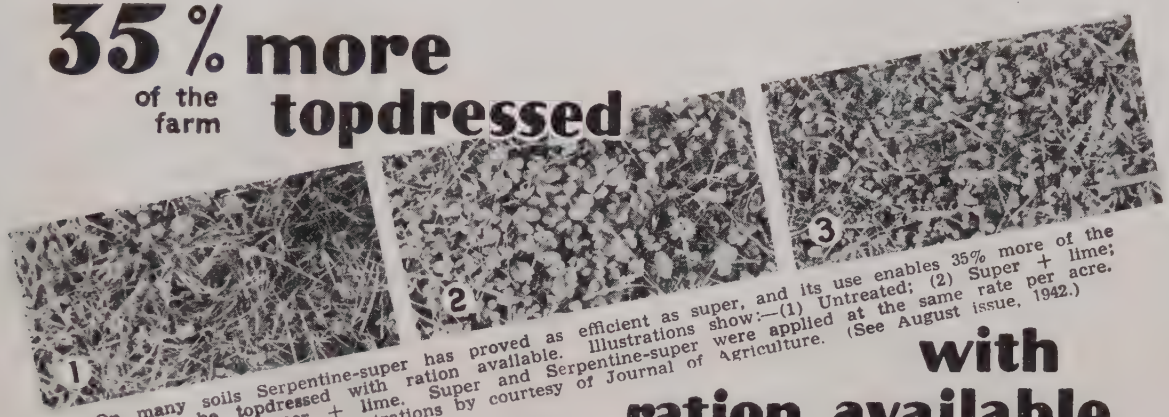
A binder must always be stored under cover, in a place where poultry cannot roost on it, rain drive in on it, or odd things like sacks, oil-drums, etc., be put on it. Clean the whole binder down, using paraffin and a brush where necessary—for example, on the knotter and roller gearing. Remove the canvases and go over them for any breakages; have these repaired. Store canvases in a dry place away from rats and mice. Remove all chains and soak them in paraffin, clean them and store in waste oil until next season. Remove the knife, see that both this and the spare knife are sharp, and grease them thoroughly before packing away. Grease all fingers and similar bright parts to prevent rusting —especially the knotter bills—and grease all bearings thoroughly.

Where pneumatic-tyred wheels are fitted they should have all the weight taken off them by screwing down the main wheel, blocking up the binder to keep it level, and finally screwing up the main wheel again.

Don't

neglect internal parasites in poultry. Full information is available in the Department's free bulletin No. 19.

35% more of the farm topdressed with ration available



On many soils Serpentine-super has proved as efficient as super, and its use enables 35% more of the farm to be topdressed with ration available. Illustrations show:—(1) Untreated; (2) Super + lime; (3) Serpentine-super + lime. Super and Serpentine-super were applied at the same rate per acre. —Illustrations by courtesy of Journal of Agriculture. (See August issue, 1942.)

Dairy Conference supports use of Serpentine Super

The June issue of the "Exporter" reports that the Dairy Conference supported the attitude of the Department of Agriculture on the use of Serpentine-super. In the August, 1942, Journal of Agriculture, page 67, the Department advised the use of Serpentine-super on the strength of tests which showed that 35% more of the farm could be topdressed with the ration available.

But whether you use Serpentine-super or Super and Lime—as the Journal also advises on page 68—

you can mix it better yourself & spread it THINNER

Enthusiastic owners support use of "TRIUMPH" Topdresser

Mr Rodney Coates, Matakohe. North Auckland, says:—
"We have tried all the best makes, but "I think there is only one economical "distributor for this country, suitable "for lorry, wagon, or dray, the Munro "TRIUMPH." Saves mixing, and **sows "any quantity, 1 cwt. up**, through one "box and a ton through the other."

Mr W. Young, of Otahuti R.D., says:—
". . . used all sorts of manures and "lime, including salt from tannery "with lot of fat and hair in it."

with *The Munro* **TRIUMPH Topdresser**

Get facts about amazing economy of Munro "Triumph" in actual use. Post Coupon for FREE Booklet to
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Please send Free Booklet on "Triumph" Topdresser.
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Address.....

J.A.

Lambing Estimates For 1943

Contributed by the LIVESTOCK DIVISION.

IN estimating the number of lambs no account has been taken of the effect of a probable increase in the number of breeding ewes, since the 1941 figures were collected and this must be borne in mind when comparing the estimated number of lambs with those of previous years.

It will be noticed that taking the Dominion as a whole the estimated lambing percentage is lower than that for the last three years, attributed to unseasonable climatic conditions.

As for the last six years South Island returns are higher than those for the North Island. In general there has been a considerable drop in all districts with the exception of Southland.

County.	Breeding Ewes.	Estimated Percentage of Lambs.	Estimated Number of Lambs.
AUCKLAND DISTRICT			
Mangonui	33,111	85.00	28,144
Whangaroa	13,662	87.00	11,886
Bay of Islands	60,793	87.00	52,843
Hokianga	54,527	82.50	44,985
Whangarei	100,347	84.87	85,164
Otamatea	75,754	86.00	65,148
Hobson	69,958	90.03	62,983
Rodney	82,007	77.88	63,867
Great Barrier	7,169	72.81	52,197
Waitemata	67,146	90.53	60,787
Eden	2,314	100.00	2,314
Manukau	61,023	95.00	57,972
Franklin	96,399	95.50	92,061
Coromandel	39,416	70.79	27,903
Thames	10,114	72.50	7,333
Hauraki Plains	12,775	89.99	11,496
Ohinemuri	10,953	90.52	9,914
Waikato	134,971	96.81	130,665
Raglan	343,133	89.00	305,388
Waipa	154,784	95.85	148,360
Piako	98,411	98.00	96,442
Matamata	183,427	99.43	182,381
Rotorua	67,887	88.0	59,740
Taupo	19,571	86.50	16,929
Taumarunui	90,680	85.10	77,169
Kawhia	56,996	88.88	50,658
Otorohanga	118,599	90.00	106,739
Waitomo	300,472	87.25	262,162
Ohura	105,365	85.20	89,771
Kaitieke	57,802	81.65	47,195
Tauranga	92,872	94.00	87,300
Whakatane	40,409	88.50	35,762
Opotiki	52,626	76.96	40,501
Totals	2,715,473	91.11	2,474,159

County.	Breeding Ewes.	Estimated Percentage of Lambs.	Estimated Number of Lambs.
EAST COAST-HAWKE'S BAY DISTRICT.			
Matakaoa	63,379	81.51	51,660
Waiapu	252,799	80.12	202,543
Uawa	127,970	82.13	105,102
Cook	443,179	86.4	382,907
Waikohu	368,102	83.34	306,776
Wairoa	410,897	81.88	336,442
Hawkes Bay	929,939	87.52	813,883
Waipawa	392,574	85.62	336,122
Waipukurau	128,147	99.14	127,045
Patangata	499,491	81.89	409,033
Weber	53,259	88.00	46,868
Dannevirke	269,467	94.20	253,838
Woodville	80,378	77.50	62,293
Pahiatua	157,724	93.90	148,103
Akitio	160,172	74.20	118,848
Totals	4,337,477	85.34	3,701,463
WEST COAST-WELLINGTON DISTRICT			
Clifton	71,377	94.49	67,444
Taranaki	18,404	99.77	18,362
Inglewood	37,675	89.49	33,715
Egmont	21,029	97.16	20,432
Stratford	80,134	93.20	74,685
Whangamomona	47,378	85.50	40,508
Eltham	50,297	98.45	49,517
Hawera	75,613	92.40	69,866
Waimate West	5,684	94.21	5,355
Patea	200,278	97.60	195,471
Waitotara	134,955	91.90	124,024
Waimarino	169,112	86.00	145,436
Wanganui	261,680	88.60	23,185
Rangitikei	948,933	95.50	906,231
Oroua	203,784	102.00	207,860
Kairanga	109,377	103.03	112,691
Kiwitea	229,073	92.50	211,893
Pohangina	117,795	94.00	110,727
Manawatu	146,150	113.24	165,500
Horowhenua	116,009	91.71	106,392
Hutt	72,390	77.55	56,138
Makara	44,515	78.44	34,918
Featherston	315,698	86.00	271,500
Wairarapa South	162,098	86.00	139,404
Masterton	295,884	79.00	233,748
Castlepoint	96,452	76.00	73,303
Eketahuna	138,514	86.00	119,122
Mauriceville	45,146	68.00	30,699
Totals	4,215,434	86.54	3,648,126

County.	Breeding Ewes.	Estimated Percentage of Lambs.	Estimated Number of Lambs.
MARLBOROUGH-NELSON-WESTLAND DISTRICT.			
Waimea	168,128	73.00	122,733
Takaka	26,558	75.00	19,919
Collingwood ..	13,199	79.00	10,427
Buller	2,487	100.00	2,487
Inangahua	13,534	103.70	14,035
Murchison	32,565	94.80	30,872
Grey	24,764	104.80	25,953
Westland	36,066	103.08	37,179
Sounds	101,456	58.47	59,321
Marlborough ..	195,771	76.52	149,804
Awatere	205,875	82.90	170,670
Totals	820,403	78.42	643,400
CANTERBURY-KAIKOURA DISTRICT.			
Kaikoura	112,418	63.00	70,823
Amuri	228,670	57.00	130,342
Cheviot	145,070	85.00	123,309
Waipara	283,603	85.00	241,063
Ashley	63,146	75.00	47,360
Kowai	66,359	90.40	59,989
Oxford	71,258	72.60	51,733
Rangiora	33,220	89.00	29,566
Eyre	49,569	95.00	47,091
Tawera	51,924	67.50	35,049
Malvern	111,652	94.00	104,953
Paparua	29,946	99.00	29,647
Waimairi	4,193	99.00	4,151
Heathcote	10,333	88.00	9,093
Akaroa	86,275	103.80	89,553
Mt. Herbert	40,410	96.00	38,794
Wairewa	71,456	92.30	65,954
Halswell	13,298	85.30	11,431
Springs	26,206	107.40	28,145
Ellesmere	78,337	107.90	84,526
Selwyn	144,544	76.50	110,576
Ashburton	647,761	92.80	601,122
Geraldine	231,694	78.00	180,721
Levels	144,414	98.40	142,103
Mackenzie	304,723	76.00	231,589
Waimate	431,309	93.00	401,117
Chatham Islands ..	41,003	73.00	29,932
Totals	3,522,791	85.15	2,999,732

County.	Breeding Ewes.	Estimated Percentage of Lambs.	Estimated Number of Lambs.
OTAGO-SOUTHLAND DISTRICT.			
Waitaki	416,955	82.20	342,737
Maniototo	249,853	80.70	201,631
Vincent	254,222	85.50	217,360
Waihemo	94,422	80.00	75,538
Waikouaiti	65,433	89.00	58,235
Taieri	164,635	80.00	131,708
Peninsula	15,698	83.00	13,029
Clutha	385,263	97.00	373,705
Tuapeka	323,179	93.30	301,526
Bruce	213,059	90.00	191,753
Lake	133,333	70.80	94,400
Southland	1,541,199	107.40	1,655,247
Wallace	560,210	91.40	512,032
Stewart Island ..	1,894	80.00	1,515
Totals	4,419,355	94.37	4,170,416

DISTRICT ESTIMATES.

The following table gives the estimates for the current (1943) season's lambing for the several sheep districts:—

District.	Number of Breeding Ewes.	Estimated Percentage of Lambs.	Estimated Number of Lambs.
Auckland	2,715,473	91.11	2,474,159
East Coast-Hawke's Bay	4,337,477	85.34	3,701,463
West Coast-Wellington	4,215,434	86.54	3,648,126
Marlborough-Nelson-Westland ..	820,403	78.42	643,400
Canterbury-Kaikoura	3,522,791	85.15	2,999,732
Otago-Southland ..	4,419,355	94.37	4,170,416
Dominion ..	20,030,933	88.05	17,637,296

Dominion Totals

The following table shows the estimated lambing for the North and South Islands for the previous five years, together with the actual number of lambs tailed:—

Year.	* Number of Breeding Ewes (as at 1941).	Estimated Percentage of Lambs.	Estimated Number of Lambs.	Actual No. of Lambs Tailed.
	NORTH ISLAND.			
1943	*11,268,384	87.18	9,823,748	——
1942	*11,268,384	89.95	10,134,505	10,835,934
1941	*11,268,384	90.74	10,224,786	10,593,291
1940	10,917,684	89.01	9,717,488	10,348,649
1939	10,889,802	84.40	9,190,994	9,476,647
1938	10,735,829	80.11	8,600,625	9,034,385
	SOUTH ISLAND.			
1943	*8,762,549	89.16	7,813,548	——
1942	*8,762,549	93.34	8,179,674	8,028,958
1941	*8,762,549	91.60	8,026,076	7,929,999
1940	8,809,973	91.69	8,078,518	8,037,123
1939	9,070,497	86.29	7,826,601	7,752,922
1938	8,928,037	90.10	8,044,540	7,914,594
	DOMINION.			
1943	*20,030,933	88.05	17,637,296	——
1942	*20,030,933	91.43	18,314,179	18,864,892
1941	*20,030,933	91.11	18,250,862	18,523,290
1940	19,727,657	90.21	17,796,006	18,385,772
1939	19,960,299	85.26	17,017,395	17,229,569
1938	19,663,866	84.64	16,645,165	16,948,979

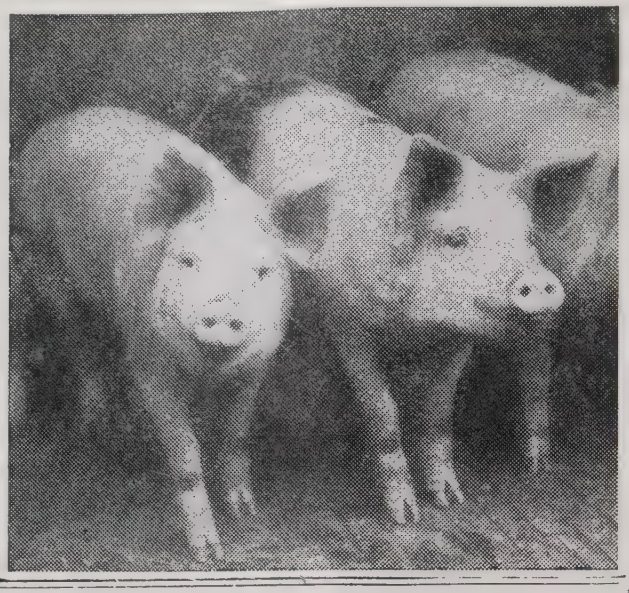
America's Victory Gardens.

AMERICA'S Victory-garden programme for 1943, summarised with satisfaction by the Secretary of Agriculture, Mr. Claude Wickard, at the Victory Garden Harvest Festival at Chicago, Illinois, has proved that Americans can meet emergencies.

Approximately 20,000,000 gardens were cultivated, about 4,000,000 acres of land were used for them, and some 8,000,000 tons of food were produced. This means that approximately one out of every two families in the United States had Victory gardens.

The production amounts to about 125 pounds of food for every man, woman and child in the civilian population. Home production of this quantity of food frees the transport system from an enormous burden and leaves it better able to transport the supplies the fighting men need.

Better Health
means
Better Growth



Take a look at these pigs. They are part of a line, test fed on Tomoana Fortified Meal by Mr. W. H. Lewis Morgan of Pukekohe East. The test was carried out under the supervision of Mr. H. E. Clark, Auckland District Pig Council Supervisor. Here are the figures:—

The following is the result of the feeding trial car ried out by Mr. Lewis Morgan, of Pukekohe, with the assistance of the Auckland Pig Council Supervisor— Mr. Clark.

No. 1 Pen of 6 Pigs was fed on the following:—

Tomoana No. 1 Meat Meal——1lb. per pig per day
Barley .. ..½lb. per pig per day
Tallow .. .. .. 1lb. per pig per day
Swedes to appetite.

NO. 1 PEN—STRAIGHT MEAT MEAL

	Date of Weighing	1	2	3	4	5	6	Total
1	3.4.43	40	63	48	62	60	48	321
2	17.4.43	47	69	54	67	69	54	360
3	3.5.43	59	77	66	79	94	75	450
4	15.5.43	63	84	74	83	105	82	492
5	4.6.43	79	105	90	105	121	97	617
6	17.6.43	81	116	91	111	129	106	**634**

No. 2 Pen of 6 Pigs was fed on the following:—

Tomoana Fortified Meal .. 1lb. per pig per day
Barley .. .. .. ½lb. per pig per day
Tallow .. .. .. 1lb. per pig per day
Swedes to appetite.

NO 2 PEN—FORTIFIED MEAL

1	3.4.43	70	58	50	35	68	40	321
2	17.4.43	92	79	70	44	84	46	415
3	3.5.43	106	98	70	52	100	58	484
4	15.5.43	120	113	90	62	107	65	559
5	4.6.43	142	132	109	79	129	82	673
6	17.6.43	152	148	116	85	142	86	**729**

EXTRA WEIGHT OF SIX "FORTIFIED" FED PIGS .. .. 95lbs.

95lbs. live weight equals (approx.) 64lbs. dead weight at 7d. lb. equals £1 17 4

450lbs. of each Meat Meal was used, and, since "Fortified" cost £2 per ton more, the extra cost of feeding "Fortified" was 10 0

ACTUAL CASH GAIN WITH FORTIFIED MEAL £1 7 4

PUKEKOHE EAST,
12th October, 1943

Messrs. W. & R. Fletcher (N.Z.), Ltd.,
AUCKLAND.

Dear Sirs,

When you placed Tomoana Fortified Meal on the market I decided to carry out a feed trial, comparing it with Meat Meal. I might mention that I have carried out several pig feeding trials with various foods and mixtures during the last few years, and this was one that certainly showed good results. With two pens of six pigs (each pen weighing the same) the live weight gain during sixty days was 95lbs. more for the Fortified Meal fed pen than the Meat Meal pen The extra cost of the Fortified Meal over the Meat Meal was about ten shillings for the amount consumed, but the net gain for the six pigs amounted to £1/7/4. This trial was carried out during the winter when there was practically no milk available, but other foods used were grain meals and swedes to appetite. In my opinion Fortified Meal is going to be a very valuable supplementary food for winter feeding.

Yours faithfully,
W. H. LEWIS MORGAN.

Growth and Health go hand in hand

TOMOANA
FORTIFIED
MEAL

W. & R. FLETCHER (N.Z.) LTD.

The National Pig Industry Council

Incredible as it may seem, there are still farmers unaware of the activities of the National Pig Industry Council, established in New Zealand seven years ago. It is timely, therefore, that an outline of the work of this organization through its District Pig Councils and their supervisors should be stressed.

— By —

H. M. PEIRSON,

Acting Superintendent of the Pig Industry, Wellington

THE National Pig Industry Council has been closely associated with all the major improvements in the pig industry. This movement has been, and still is, essentially valuable, for the reason that it creates an organisation that can speak with one voice on the needs of the industry, though within the movement there are many who came in merely for personal advantage. Others stay out, because they fail to see any immediate advantage to themselves. Both miss the importance of united effort. In the industry there are fifty thousand producers, and if the progress made by some were common to all, the industry would be perfect within a year.

The facilities that the National Pig Industry Council provides through its District Pig Councils, utilised on even the smallest farms, bring about improvements. Even if they are only commonplace improvements, they are possible for all.

Competitions

Not the least of the Council's activities are the bacon carcase competitions, such as those recently held at Westfield, Patea, Hastings, and Gisborne, at which no fewer than 3,000 carcarcases were exhibited. These competitions can be said to have been the biggest of their kind ever held in the Southern Hemisphere.

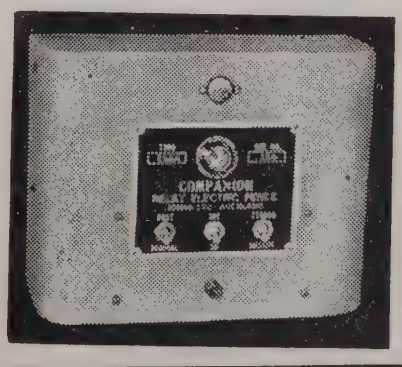
The organisation of these competitions was undertaken by the National Pig Industry Council, in conjunction with a commercial export firm, which generously provided the facilities and the prize money. The exhibits were of outstanding merit and of great educational value.

One of the objects of these competitions is the demonstration of the possibilities of profitable carrying of pigs through the winter months. With the disappearance of the milk supply in May, those who still have pigs on hand are faced with the difficulty of getting through the winter months. There are many different ways of meeting the winter feed shortage. One is to avoid pigs in winter by selling weaners and stores before the end of May at sacrificial prices. Those who get rid of their winter responsibility make difficulties for themselves in October, November, and December, when young pigs are unable to cope with the abundant milk supply. After seeing the results of the "Tomoana" baconer competitions it is hard to believe thos who claim that it does not pay to winter home-grown pigs on home-grown crops, plus a foundation of bought meal.

Another advantage of these competitions is that they give opportunities to Supervisors of District Pig Councils to make new contacts and to bring before farmers in many different districts the results that have come to light in these competitions—results that might not be picked up by a farmer reading a report of them, but which are apparent to him when he talks them over on his farm with a man who, like himself, has a practical working knowledge of pigs.

Duties of Supervisors

The Supervisor's approach to the subject of pigs is to discover quickly whether or not pigs are run efficiently on the farm that he visits. A reason-



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23 CHANCERY ST., Auckland. Box 471X

able standard of efficiency is a net return of £2 per cow, which may be made up by a gross value of £3 per cow, less the cost of feed and pigs of £1 per cow. If he finds that a farmer is getting this kind of return, he will congratulate him on the result, encourage the farmer to explain how it is done, and learn all he can of that particular farmer's methods. However, if he finds the returns are low, he will try to find out the reason, and without delay assist him with his problems.

Whether the returns are good or bad, the Supervisor has to ask a number of leading questions, and, provided these are suitably mixed in the general discussion and comment, few farmers mind answering questions that are obviously sincere, especially when the questioner shows a definite interest. The Supervisor finds out how many cows are milked and how many calves are reared. He then inquires whether the owner thinks bacon, pork, or weaner production the most profitable. In general, the Supervisor knows that when pork and bacon are 6d. per lb. and weaners 18/-, all are equally profitable from the point of view of feed used.

Then follow questions on what kind of produce, cheese or butter, the farmer goes in for, how many sows he runs, and how many pigs he sold in the last year. The Supervisor makes a rapid calculation, taking baconers at £3 15/-, porkers at £2, and weaners at ruling prices, and, knowing the number of cows, can suggest a gross return per cow received from pigs. It sometimes happens that the Supervisor strikes the wrong man, or the wrong approach, but he is not disheartened by setbacks, for he knows that quite often the greatest response comes from men who are hardest to convince.

Efficiency Feeding

A few facts about pigs usually encourage the listener. For instance, the average number of pigs sold per sow in New Zealand is approximately 10. Where baconers are produced, one sow is kept for 10 to 16 cows. Where porkers are produced one sow to 6 or 7 cows is kept, and where weaners are produced one sow to 3 to 5 cows. If the ratio of sows to cows is less than this, then much feed (roots or grass) other than skim-milk or whey is used. Here again the Supervisor wants a few pegs. If feed is efficiently used, every pound of pig-meat sold can be produced for 6 lb. of feed, or gallons of milk.

If £100 worth of pigs are sold, then not more thon 24,000 lb. of feed should have been used, or to put it in another way the pounds of feed should equal in pence the value of meat sold.

From the number of cows milked, a rapid calculation gives approximately the total gallons of milk provided (1 gallon skim-milk or 1½ gallons whey equals 1 lb. feed) and how much meal has been used (the standard recommended is 1 cwt. per cow milked). Where the total of gallons plus pounds of meal is greater than the total number of pence-worth of pig-meat sold, feed is not used efficiently.

It is pointed out that on the best farms the feed, as milk and meals, does not exceed 60 to 80 per cent. of the total feed used. This raises the

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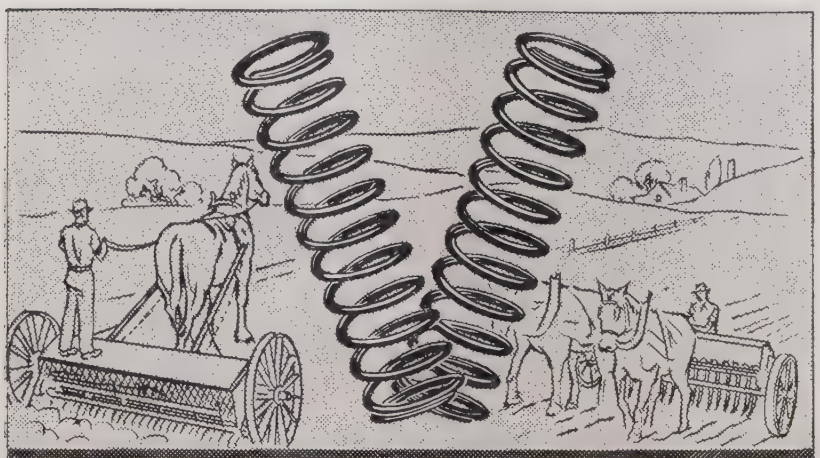

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question of (a) crops and grass used for pig-feed, (b) ways of feeding meal, (c) the best means of getting value out of meals as it applies to very young pigs, (d) when sows farrow, how well the pigs are done from weaning to four months old, (e) having on hand pigs big enough to utilise the milk in the flush of the season.

Housing

When the discussion turns to the subject of housing and accommodation, especially where new equipment has been provided, interested enquiry is made regarding costs and capital invested. Where equipment wants replacing, the Supervisor will suggest the adoption of what he has already seen on the best places. He provides the farmer with the Department of Agriculture's free bulletin on "Housing and Construction of Modern Piggeries," making suggestions with regard to a lay-out suitable to the particular farm in question. If difficulties have been experienced in obtaining the necessary material, here again the Supervisor can help, because the Building Controller has agreed to release building materials for piggeries, when application is made through the local District Pig Council, and recommended by that Council, to the local Building Controller.

The Supervisor does not seek to force his views on to the farmer regarding the type of piggery he should build, but rather to help him utilise the material he has to the best advantage, even to the extent of assisting him manually with its erection.

Lay-out of Piggeries

He will point out the advantages and disadvantages of certain kinds of lay-out. Dispersed or open-air units, for instance, have the advantage of requiring less cleaning, and they provide fresh grass, if properly handled, at all times of the year. How they are usually ruined by over-stocking is pointed out. They have the disadvantage of inconvenience, and often hard work in feeding, especially in wet weather, and are therefore not altogether suitable for wet climates. On the other hand, units under one roof, with water laid on and proper drainage facilities, have the advantage of ease and quickness of feeding, and ability to control the pigs and their conditions. More time is required to keep them clean, but time so spent gives satisfaction.

Centralised units can, however, become just as objectionable under bad management conditions as any open-air lay-out similarly treated. Supervisors sometimes find fair to bad conditions and equipment associated with good to excellent returns; hence they know the importance of not judging any outfit on appearance only.

Farmers are entitled to the assistance and advice of the District Pig Council Supervisors. Pig producers have provided the funds to enable these Councils to be set up, and all farmers are urged to take every advantage of these facilities. Applications for assistance should be made to the Department of Agriculture or to District Supervisors as follows:—Whangarei (Box 131); Pukekohe (Box 32); Whakatane (Box 12); Gisborne (Box 316); New Plymouth (Box 131); Palmerston North (Box 80); Dunedin (Box 693); Christchurch (Box 639); Hamilton, care Department of Agriculture.

SUPERVISOR'S STANDARD OF EXCELLENCE.

1. Gross sales of pigs equal to 3d. per lb. butterfat.

2. Expenses (feed)—10/- to 15/- per cow.

3. Twelve pigs sold per sow.

4. Value of gross sales in pence equal to or greater than the total gallons of milk or pounds of feed used.

5. Sows farrow two litters a year; the first reaches bacon weight through the peak of milk supply; the second sells as pork or light bacon in mid-May.

6. At least one-quarter of an acre of roots per sow for winter and stand-by feed.

It is dependent upon the farmer's willingness to discuss pigs with the Supervisor, and it may be necessary to have many discussions, as to how and in what direction the services of the District Pig Council can be used. The National Pig Industry Council, through District Councils, endeavours to give the farmer the benefit of its Supervisors' experience and practical knowledge gleaned from and by their associations with other farmers.

The Supervisor's aim is not that of spending the farmer's money on unnecessary equipment, as sometimes claimed, but to improve the conditions for pigs generally, and in so doing increase production along sound lines. **He is not interested in where pigs are sold, or who buys them,** nor is he permitted to accept commission or payment for any service rendered.

For these reasons alone, if for no other, operators, agents, curers, meat-exporters and auctioneers give full support to the work of the National Pig Industry Council, and their farmer clients are recommended to make full use of this service by contacting their District Pig Council or the local office of the Department of Agriculture.

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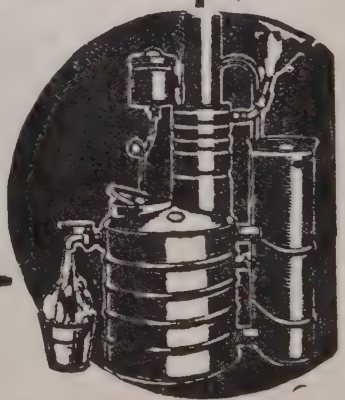

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Common External Parasites of Farm Animals

This article deals with those external or skin parasites commonly met with in farm animals in New Zealand, these being lice and ticks in sheep, lice in cattle and horses, sarcoptic mange and lice in pigs, and ringworm in cattle.

— By —
J. MULLINS, M.R.C.V.S.,
Veterinarian, Hamilton.

ALL parasites, external and internal, thrive and propagate at the expense of their host, and do an amount of damage according to the species and severity of the infection. Fortunately, most varieties of external parasites have their own species of host and will not live on any other; for example, the pig louse will not live on the sheep, and vice versa.

New Zealand is fortunate in that sheep scab or sheep mange is non-existent here. Freedom from this disease can scarcely be appreciated as it might be by those who have never experienced its ravages and the difficulties in its control and eradication, especially in hill country. At present, New Zealand sheep-owners have only to concern themselves with lice and ticks.

The sheep tick is darker and larger than the sheep louse, and may be seen on the surface of the wool on warm days. It is a blood-sucker, and if present in great numbers, does appreciable harm. The tick lays on the wool live larvae, which become adult in about three weeks.

Sheep Lice

Of sheep lice, there are a few varieties, the most common being the red-headed louse, which is small and pale in colour. They are very active and may be difficult to see in the wool. They are found gathered near the skin on the neck, shoulders, back and thighs, where the sheep cannot get at them, and in bad cases they may be found all over the body.

Lice cause great irritation and prevent the sheep thriving. They lay eggs which are attached to the wool fibres from which the young lice hatch out and become adult in about three weeks. Like the tick, they never, at any stage, purposely leave their host—the sheep—but are transferred to other sheep and various objects by rubbing and direct contact. This also applies to ticks. Lice and ticks do a lot of damage to the wool by staining due to excreta, and indirectly by causing rubbing and scratching; they also lower its value.

Other Species

Other species of lice affecting sheep are the face louse and the leg louse, the face louse being very rare. The leg louse is larger than the body louse, and is confined to the legs. This parasite is said to do little harm, but all parasites exist for their own good rather than that of their host. Dogs, although not normally hosts for sheep lice and ticks, may transfer them mechanically to clean sheep, so it is advisable to dip the dogs at the same time as the sheep.

It is an offence to offer, or expose for sale, lousy sheep in any public saleyard.

With a view to the control and destruction of sheep lice and ticks, all sheep in the North Island must be dipped between January 1st and March 31st; or further than this, as may be found necessary.

Value of Dipping

Dipping is an important annual event in sheep farming, and one that pays handsomely for the time and labour expended when carried out in a thorough fashion. It rids the fleece of parasites, and allows the sheep to thrive with a consequent improvement in the wool. The first consideration is a complete muster, because sheep that are missed are a source of re-infection to clean-dipped sheep, thus nullifying the best efforts.

The selection of a suitable day is most important, one of low humidity and moderate temperature being the ideal. A wet day is not suitable for the reason that the rain-sodden wool will not freely admit the dip, and what is admitted is washed out too quickly. For another thing, drying is impossible. A hot day predisposes to scald. Sheep should be rested and have access to water before dipping. Heated, tired sheep may be seriously affected with scald, possibly with pneumonia following, even in good weather.

The best method is to rest the sheep over night, dip till midday, and, after draining the sheep in the draining pen, allow them out to dry in a shady place. By nightfall all the dipped sheep should be dry, and no harm can accrue. Dirty, daggy sheep should be cleaned up before dipping, as such sheep foul the dip and reduce its effectiveness.

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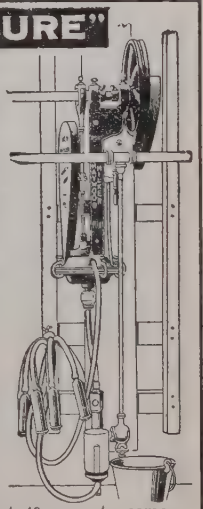
The lower the Milking vacuum the higher the Pulsation vacuum in proportion, accounting for the exceptionally fast milking and comfort qualities of the "NEW DEPARTURE"—the world's fastest, safest Milker. Space does not allow of a full description, but further details are available without obligation, on request. See illustrations and brief descriptions in earlier issues of this paper.



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- **Clean your Teeth after EVERY meal (or eat an apple).**
- **Have your Teeth examined TWICE A YEAR.**

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Must be Thorough

The technique of dipping is simple, but for good results the work must be carefully and thoroughly done. Allowing each sheep a minute in the dip, completely immerse its body at least twice, and take care to allow ample breathing space between immersions of the head. Great care must be taken with rams, particularly before the breeding season, when hand-immersion or spraying may be more advisable. Biting dogs should not be used at this time, nor rough treatment of sheep allowed, as wounded or bruised tissues may absorb sufficient of a poisonous dip to cause death, apart from the danger of bacterial infection.

When it is considered necessary to dip ewes with lambs, care must be taken that the ewes are thoroughly dry before returning them to the lambs, or there is danger of poisoning the lambs. It is not advisable to dip unweaned lambs because of the danger of mis-mothering, as the lamb-smell is temporarily destroyed. Weak, wormy hoggets and high-conditioned sheep are poor subjects for dipping, as there is a greater danger with such sheep of pneumonia following. Aspiration of the dip in careless dipping, causing mechanical pneumonia, is probably responsible for most losses after dipping. Ordinary pneumonia, due to dipping in bad weather or to unsuitable subjects, comes next. With reasonable care and observance of the required conditions for good results, there should be no losses.

Fly-Blown Sheep

The Blow-fly or Maggot fly, although not a sheep parasite in itself, lays its eggs on the living sheep, resulting in an unpleasant sight and destruction of wool and tissues. The small, yellowish species of blowfly is mostly responsible, not the blue-bottle. Weak, scouring lambs are the most susceptible. The urine-irritated crutch apparently attracts the laying fly.

Treatment of fly-blown sheep consists of shearing the wool around the affected areas, and killing and removing all the maggots, after which the affected areas may be dressed with an approved dressing such as boric acid and glycerine. All maggots on dead carcases should be destroyed, in order to prevent their development into blowflies.

A change of paddocks is advised, as the fly may be more active in some paddocks than in others. Prevention of fly-strike may be aimed at by early crutching, in December or early January, when the fly is active.

Other Animals

Cattle, horses, and pigs also have their external parasites. With lice, the most common external parasites of these animals, young, unthrifty cattle

are most frequently affected, although lice may often be found in good-conditioned calves. Winter and early spring seem to be the favourite seasons for lice in cattle, the length of the animals' coats at those times, and their lowered resistance during winter and early spring, seem to favour parasitic attacks.

Cattle lice are blood-suckers which also cause irritation, and may seriously interfere with the animals' welfare if present in large numbers. Good feeding, grooming and sterilization of covers are essential to the treatment. So, also, is an application such as kerosene and soap emulsion to the affected areas, twice, at an interval of three days.

Horses Affected

Lice on horses, as in cattle, are also more numerous in winter, and as with cattle, the poorer animals are more susceptible, with consequent aggravation of their condition. Lousy horses should be clipped all over and dressed with kerosene emulsion. Good grooming and feeding should accompany treatment. Sterilization of harness and covers, as far as possible, is also advisable. Kerosene emulsion is prepared as follows: Dissolve 1 lb. of soft soap in a gallon of boiling water. Add slowly 1 pint of kerosene and mix thoroughly. Then dilute by the addition of water, so that the mixture, when ready for use, amounts to 4 gallons.

When the emulsion so formed is cool enough, scrub it into the hair with a dandy brush, taking care that the dressing gets down on to the skin. Dressing should be repeated in three days to kill any lice which have hatched out of eggs which are not destroyed by the first application. After this application, animals should not be exposed to hot sun, as burning of the skin may occur. If it is necessary to do the entire body, about one-quarter should be dressed daily.

Lice on Pigs

The pig louse is large, easily seen, and easily destroyed. It is a blood-sucker, and also causes severe irritation and scratching, with consequent loss of condition. Young pigs are infected from the older. An oily dressing along the back on one or two occasions, or as required, will eradicate the parasite. Engine-oil or waste oil is suitable for this purpose. A self-oiling rubbing-post may be provided by wrapping it round with sacking periodically soaked with oil. This is a convenient and effective means of controlling and curing lousiness in pigs. Badly affected young pigs should be hand-dressed to ensure destruction of the lice.

A more serious parasitic infection of the skin occasionally seen in the pig is that known as Sarcoptic Mange. This is due to the pig-mange mite, which burrows into the skin, especially behind the ears at first, causing numerous pimple-like elevations accompanied by great itching and loss of condition. The skin gets scaly and thickened in old-standing cases, and may become broken in parts due to rubbing and scratching.

Being highly contagious, it spreads through the in-contact pigs with serious results if untreated, especially in young suckers. Treatment of this parasitic infection in pigs will be the same as for lice, that is, an oil dressing by any of the known means. An oil bath may be the most convenient if dealing with large numbers. This

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A CONDITION of inflation may give a pretence of prosperity but, unless checked, it leads inevitably to suffering.

From the day when the spendable money in the hands of the people began to exceed the volume of goods and services they could spend it on, inflation began, that is to say, prices began to rise (despite control) and the purchasing power of the £ became smaller and smaller.

All the people suffer under inflation, and particularly—

(1) *The thrifty, i.e, those who have their savings in cash, Savings Banks, National War Savings, War Loans, and Life Assurance.*

(2) *Civil Servants, clerks, teachers, and all on fixed salaries and wages.*

(3) *The aged who are living on the proceeds of investments or on pensions.*

(4) *Owners of houses who rely on the income from them for their livelihood.*

The only way to check the suffering, the only way to maintain the purchasing power of the £, is for everyone to spend less, and to put more money into National War Savings and Life Assurance. It may seem a contradiction, but it is the cold truth.

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8

bath is usually but a film of oil on water, through which the pigs are passed. A few treatments may be necessary with some days' interval.

It is an offence to offer or expose for sale mangy pigs in any public saleyards.

Ringworm

Ringworm may also be described as an external parasitic disease. It is contagious and caused by a species of fungus, and is most commonly seen in calves and yearlings, especially in winter, although all animals are susceptible. Low condition and hardship predispose to and favour this parasite. The causative fungus lodges around the hair roots, breaking off the hair and causing bare circular patches of raised scaly skin. The regions of the head and neck are most frequently affected, but in bad cases the trouble may be found all over the body.

Fortunately, it is not a serious affection, to the extent that it is easily cleaned up by the application of tincture of iodine to the affected patches after they have been scrubbed with soap and water. A few dressings at intervals of a few days should suffice. It is advisable to wash the hands after coming in contact with such cases. Good feed and return to condition will in themselves usually result in the disappearance of ringworm.

Secret of Success

As with internal parasitic infections, good feeding and good husbandry, in addition to the usual approved methods of treatment, play an important part in the cleaning up of external parasites. Although all animals are susceptible, the weakly, debilitated animal is more easily a prey for these parasites, which seriously aggravate its condition.

Generally, the well-nourished animal in good condition, apart from being more able to withstand parasitic attacks, does not seem to offer such a favourable field for the propagation and survival of, at least, some external parasites. Promptness and thoroughness are the secret of success in eradicating all parasites.

Internal Parasites

Much concern is felt in farming circles because of the serious annual losses among sheep and calves due to the ravages of internal parasites. A bulletin has been prepared to cover all aspects of this problem, including short descriptions of the various common parasites encountered, and a summary of the methods of treatment available to the farmer. This bulletin, No. 171, is obtainable **free** from the Department of Agriculture at Auckland, Wellington Christchurch and Dunedin.

The Lucerne Crop in North Otago

— By —

T. A. SELLWOOD,
Instructor in Agriculture,
Oamaru

EACH year, new lucerne stands are being established in the North Otago district. The lucerne crop in this district is definitely one which returns the farmer good value for his work and the expenses incurred in establishment.

Although North Otago has a wide range of soil types, the greater part of these are favourable to lucerne establishment. As the period of the year approaches when final preparations for sowing this crop are to be attended to, a few references to the most important factors will, no doubt, be helpful to farmers intending to sow for the first time.

The Seed-Bed

The field selected, if it has been lying fallowed during the winter period, will now be in good condition for preparing the seed-bed. In the spring there is always a certain amount of weed-growth which has to be controlled. Use of the cultivator and harrows every fortnight to three weeks, or more frequently if necessary, will have the desired effect on the weeds. Constant topworking of the soil will also assist in firming the seed-bed, while mulching of the surface by the harrows will assist to retain the soil moisture, which is a very important feature in this district. These top working operations should be carried out up to the time of sowing. If this is done, the lucerne seed will be sown under ideal conditions, and should come away well.

Under North Otago conditions, preparatory to the sowing operation, the land is well rolled in order to provide a firm, compact seed-bed, as lucerne should be sown as shallow as possible and not more than 1 in. in depth. The seeding is at least 12-14 lb. per acre. It must be remembered that the initial establishment of lucerne is most important, and therefore it must not be jeopardized for the sake of a few extra pounds of seed. All the seed is generally sown in the one operation and not cross-drilled. The practice of cross-drilling has not proved satisfactory in the North Otago district.

Inoculation of Seed

Preparatory to sowing, the seed should be inoculated. Inoculation is most important. Its value in the establishment of the lucerne crop was demonstrated in field trials carried out by the Department many years ago, when the results were so outstanding that inoculation of the seed is now a feature in the operation of sowing the lucerne crop. The most simple method of obtaining the culture is for the farmer, when ordering his lucerne seed, to make the necessary arrangement with his merchant for the required amount of culture also. The operation of inoculating the seed is straightforward, and if the instructions accompanying the culture are followed, no trouble should be experienced. When treating the seed, the grower would be well advised to treat it in a cool place, away from direct sunlight, where a cool breeze will fan over the treated seed. The

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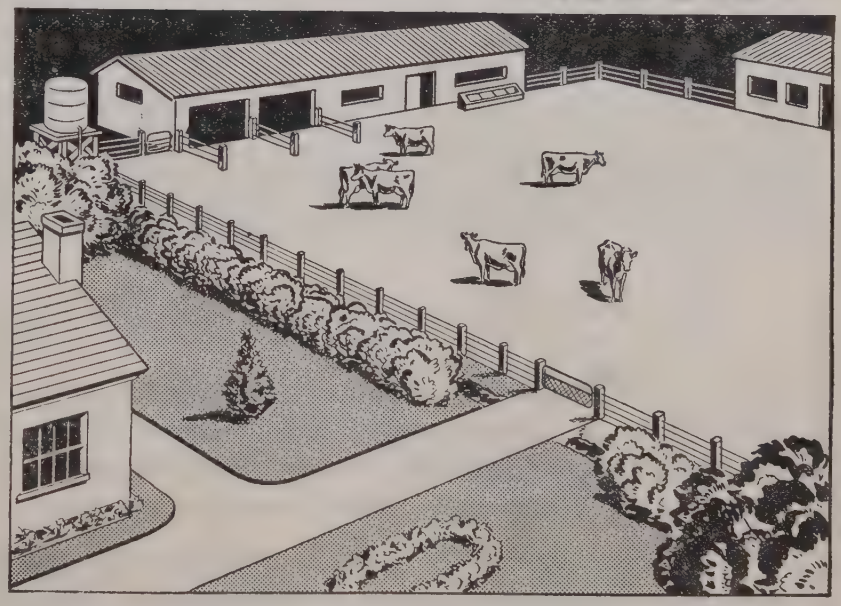

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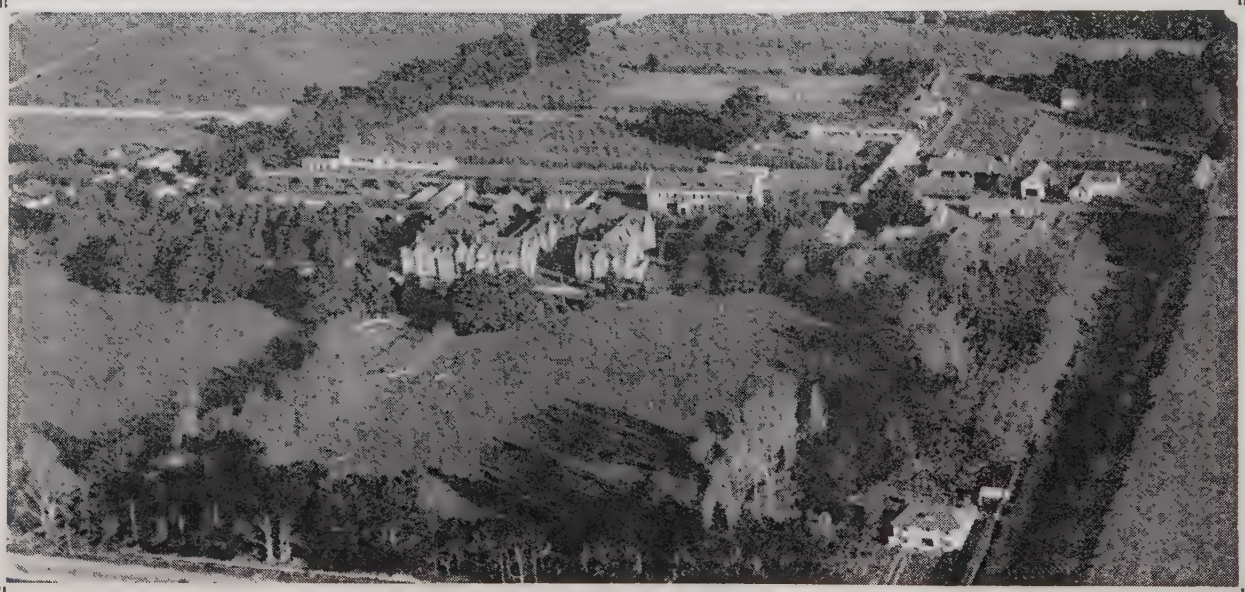

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Large numbers of Old Students of the College are prominent in the farming industry throughout New Zealand; many others hold important Academic, Scientific and Administrative appointments.

Detailed information available from the Director,

PROFESSOR E. R. HUDSON,
Lincoln College, P.B.,
CHRISTCHURCH.

seed should not be made too damp. If spread on grain sacks, it will dry very quickly, and be ready for using soon after it is treated. The grain sacks make it easy to handle when bagging up again.

Liming Essential

The land should be well limed, irrespective of whether the crop is being sown on limestone country or not. Lime is essential to good lucerne growth, as it corrects soil acidity, and lucerne does not respond to sour conditions. Lime also increases the activity of the nitrogen-fixing bacteria and other useful bacteria which may be in the soil in which the crop is being sown. The amount of lime used should be not less than 10 cwt. of carbonate of lime per acre. Up to 1 ton would be all to the good. Superphosphate, at the rate of 1 cwt. per acre, should be used, or this may be substituted by using reverted super. Fertilisers and seed should not be sown in direct contact, but through separate boxes. The pre-drilling of super and lime is an advantage, and may be lightly worked into the soil. This operation should be attended to approximately a fortnight to three weeks before the crop is to be sown. If convenient, there is no objection to the lime being applied during the late autumn and early winter. The period for the application of lime is that time when it is most convenient to the farmer.

Early Sowing

Sow the crop sufficiently early in order to allow it to become well-established before the winter period, so that the young and tender lucerne plants will not be damaged by early frosts. Therefore, the best time to sow is from November to January, and not later than February. After sowing the crop, do not use the roller, but give the seed-bed a light harrowing so that the seed will be just nicely covered. Excessive wet weather conditions after rolling may tend to crust the surface and consequently have a detrimental effect on the young lucerne plants.

There is no doubt whatever that a well-established stand of lucerne on the farm is an insurance against feed-shortage at all times. Further information relative to the establishment of this crop may be obtained from the local Instructor in Agriculture.

Slaughterings of Stock

THE following returns of slaughterings of stock at meat-export slaughterhouses and abattoirs for the months, May to October, 1943, have been compiled by the Livestock Division:—

District.	Cattle	Calves	Sheep	Of which Ewes were	Lambs	Pigs
North Island.						
Meat-export Slaughterhouses—						
Auckland	100,564	538,595	84,560	34,563	111,034	58,286
Poverty Bay-Hawkes Bay	23,462	55,247	74,166	33,751	129,604	9,851
Taranaki-Manawatu ..	53,986	186,450	50,690	26,210	168,194	39,136
Wairarapa-Wellington ..	20,513	26,444	54,546	26,788	125,337	7,314
Totals	198,525	806,736	263,962	121,312	534,169	114,587
Abattoirs	71,542	22,033	337,650	145,227	46,264	20,003
North Island Totals ..	270,067	828,769	601,612	266,539	580,433	135,190
South Island.						
Meat-export Slaughterhouses—						
Nelson-Marlborough ..	1,476	10,401	7,393	4,552	38,053	4,232
Canterbury-Westland ..	7,364	31,209	133,081	108,153	340,207	14,826
Otago-Southland	9,517	32,875	74,791	61,228	569,564	2,556
Totals	18,357	74,485	215,265	173,933	947,824	21,614
Abattoirs	29,911	5,769	141,962	82,877	16,528	7,439
South Island Totals ..	48,268	80,254	357,227	256,810	964,352	29,053
Dominion.						
Meat-expt. Slaughterhouses	216,882	881,221	479,227	295,245	1,481,993	136,201
Abattoirs	101,453	27,802	479,612	228,104	62,792	28,042
Grand Totals	318,335	909,023	958,839	523,349	1,544,785	164,243
Same Period, 1942— Meat-export Slaughterhouses and Abattoirs ..	346,294	908,889	815,279	477,252	1,405,681	219,798
Same Period, 1941— Meat-export Slaughterhouses and Abattoirs ..	281,300	911,899	843,228	505,184	1,599,765	278,219

Slaughterings of Pigs

The 44,515 pigs slaughtered at meat-export slaughterhouses and abattoirs during the month of October, 1943, were distributed in weight ranges, approximately, as follows:—

Up to 60lb.	241
61 to 120lb.	9,490
121 to 160lb.	28,543
161 to 180lb.	3,767
Over 180lb.	1,386
Sundries	1,088
	44,515

The grading of porkers was 93 per cent. of first quality, 7 per cent. of second quality; and that of baconers was 85 per cent. of prime 1's, 11 per cent. of prime 2's, and 4 per cent. of second quality.

In the different weight ranges, the grading was as follows:

	Prime 1's.	*Prime 2's.*	*Seconds.*
121-160lb.	87 per cent.	10 per cent.	3 per cent.
161 180lb.	72 per cent.	21 per cent.	7 per cent.

Answer to Correspondent

Non-Breeding Cow

"J.P.P." (Raetihi):—

"I have a valuable cow that I am unable to get in calf, or rather, she loses the calf shortly after she becomes pregnant. This occurred on two occasions about twelve months ago. She is now still empty as far as I know, but I haven't noticed her bulling. Please advise what I should do."

LIVESTOCK DIVISION—

It is not quite clear whether you actually observed the aborted foetus, which would be very small, some 12 months ago, or whether the cow simply returned to the bull after an interval of some weeks. Failure to show heat period at present might be due to one of several causes. She may be low in condition due to unseasonable weather, and normal heat periods may recur once her condition improves. She may be suffering from a definite ovarian disease such as a retained corpus luteum.

Under the circumstances I should suggest that you keep the cow under observation for a few weeks, make a bone meal and salt lick available, and, if she is poor, let her have good grazing, after which you may note either definite signs that she is in calf, or return of heat periods. Treatment of ovarian disease would be a job for a veterinarian.

Care of the Header Harvester

THE life of any machine depends on how much care is taken of it, not only when actually working, but also when it is lying idle. With a harvester the following points will bear careful consideration.

Lubrication

Adequate greasing and lubrication is essential. Such machines are designed and manufactured to operate successfully with the minimum of grease and oil, but careful and adequate use of each will save much expense. When lubricating, clean all oil holes of dirt, etc., and allow the oil to get right into the bearings. In a new machine, roller bearings with oil chambers must have more grease than plain bearings. Force the grease into the bearings, until it appears at the sides to make sure that a bearing has received its fill. To allow free sliding of pulling discs, occasionally oil the variable speed pulling guide pins and the threads on the pulley hubs. The main wheels must have plenty of grease whenever the machine is to be transported on the road.

Belting

Belting on the machine should have special care. Mineral oils, generally used for lubricating bearings, soften rubber and cause it to wear quickly, thus exposing the fabric. These belts should be kept free from such oil and periodically receive a coating of belt dressing. Any dust, chaff or oil which causes belts to become glazed and slippery should be removed before the dressing is applied.

Storing the Machine

Immediately the season's work is completed, remove all grease and dust from the machine, and thoroughly clean it. Dust and grease on the machine will hold moisture, ruin paint, rust the sieves and other metal parts, thereby causing much damage. Store the machine in a dry shed. Remove the drive belts, and when cleaned, coat with vegetable castor oil, wrap in burlap, and store in a dry, cool place. Leave the door open at the bottom of the elevators. Oil all bearings and the sickle. Remove the tension from the feeder balancing spring by a support under the platform. Jack up the machine to take the weight off the tyres.

Never leave the harvester standing out in the weather. Before the beginning of the next season replace all broken or worn parts and tighten all bolts and nuts. This will save time and money.

—W. L. HARBORD, Fields Instructor, Invercargill.

List of Creameries, Cheese Factories, etc.

THIS list, amended to 31st March, 1943, contains the names of all registered dairy factories in New Zealand, names and addresses of dairy company secretaries, number of suppliers, quantity of produce forwarded for export, and other statistical information. The list has not been published since 1940 and is unlikely to be issued in 1944. A limited number of this new list is now available, price 5/-, post free, remittance with order, from the Accountant, Department of Agriculture, G.P.O. Box 3004, Wellington.

RENOWN PUMPING OUTFITS

A Renown Pump & Automatic Pressure System will give you a low cost and dependable supply of running water for years.

YES . . . Lambs being fattened require about half a gallon of water per day; ewes one to one and a half gallons.

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.....

Veterinary Notes for the Farmer

Notes on Stock Troubles Prevalent in December and January

FARM horses are by this time well seasoned to their work. When soft animals are brought into work, as may still happen for mowers, etc., care should be taken to see that collars fit well, and have sound, clean, bearing surfaces, which will reduce any tendency to chafed shoulders.

A few late mares may still be in foal, and when these are working animals they are better to continue to do a certain amount of light work. A mare due to foal should be kept in a level paddock free from water holes or ditches into which a newly-born foal might fall.

There is sometimes concern about mares going over their normal time of 11 months. This need not cause alarm, but there is some evidence that in a percentage of such cases the foal is weakly and unlikely to do much good.

Signs of approaching foaling are the appearance of a waxy like material, which may ooze from the teats, and swelling and relaxation of the vulva. An orphan foal may be reared on cow's milk, which should have about 1 part of water added to three of milk, and a teaspoonful of sugar per quart.

The Dairy Herd

In the dairy herd, cows are by now settled into their stride. Mastitis is not so troublesome as in earlier months, but temporary sterility is frequently in evidence. Unfortunately, owing to the diversity of possible causes, it is not possible to make more than very general suggestions. Veterinary advice, where available, should be sought, as each herd may require separate consideration. Keep accurate service dates; do not overwork the bull; and keep back from service any recently-calved cows and any showing unhealthy discharge. In certain areas, a bonemeal and salt-lick appears beneficial.

Internal Parasites in Sheep and Calves

A **free** copy of bulletin No. 171, which fully covers the question of the recognition and treatment of the internal parasites in sheep and calves is available from the Department of Agriculture at Auckland, Wellington, Christchurch or Dunedin.

Milk-Cooling

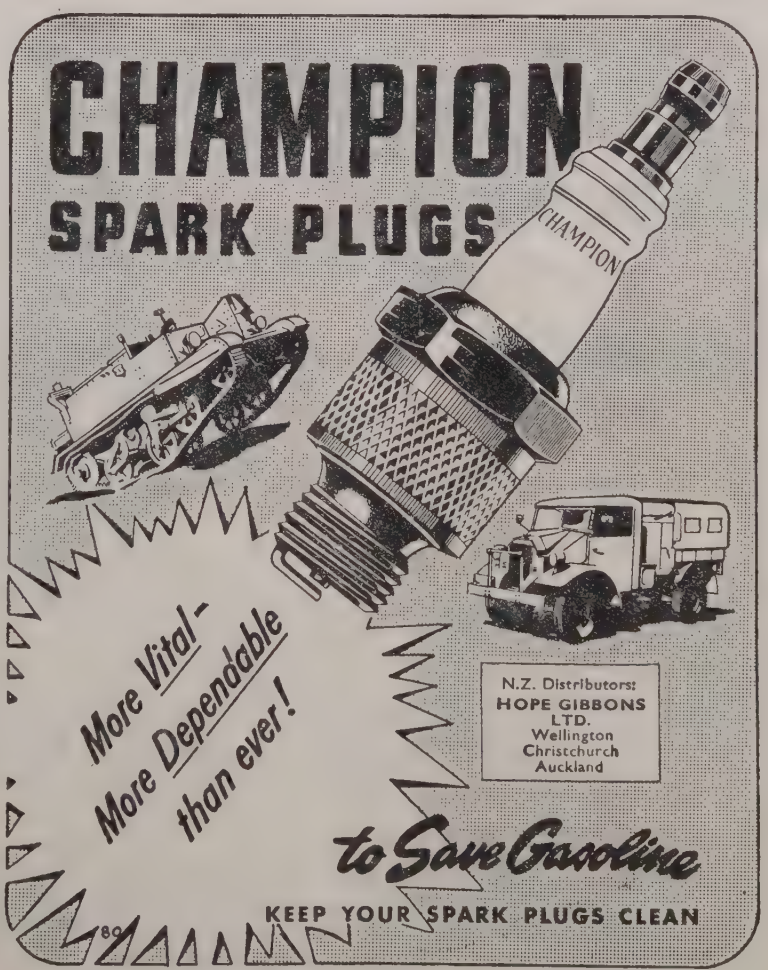
Now that the warm summer weather is here, the need for proper cooling facilities for milk and the proper functioning of these facilities become highly important, especially in those sheds from which whole milk for human consumption is supplied. Clean methods of production are important from a health point of view. Nothing plays a greater part in ensuring the keeping quality of milk, and preventing its early souring, than cooling as soon as possible to 65 deg. or lower, and holding at that. Cans of milk should not later be left standing in the sun. Cleanly produced milk kept at 50 deg. will keep for seven days, and at 60 deg. for three days. Where water cooling is used the temperature of the water should not exceed 50 deg.

* * *

The amount of hay saved at this time of year has an important bearing on the health of stock next spring.

Care After Shearing

On many sheep farms, shearing will be in progress. Mortality has occa-



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sionally followed shearing when a sudden snap of cold southerly weather has caught newly-shorn sheep in open, exposed country. Should such a change occur during shearing, newly-shorn sheep should be put in the most sheltered paddocks, and it may even be advisable to hold them in the shed overnight. Deaths from "blood-poisoning," in some cases due to blackleg, may result from the infection of shearing wounds. The dressings of wounds with a reliable antiseptic should reduce this danger. Dirty pens are a dangerous factor.

Handling Lambs

Lambs are now coming forward to the works in large numbers. Care taken in handling them during drafting and loading in order to avoid bruises, and care not to catch or pick up lambs by the wool, will reduce the number of rejections. Too many carcases are still rejected for wounds caused by rough dogs. The percentage of ewes rejected for hydatid disease is still high.

Weight of Pigs

At this season, with the warm weather, pigs should be making rapid gains, and there may be a risk of keeping baconers till they are over the specified carcase weight of 180 lb. or 170 lb. for export. The use of the weighing-machine, making a deduction of from 27 to 30 per cent. from the live weight will assist in deciding when to send pigs forward for slaughter.

—D. MARSHALL, M.R.C.V.S.,
District Superintendent.

Answers to Correspondents

Hydatids

"C.J." (Pio Pio):—

My dogs are dosed with tablets received at the time of registration. When I kill a sheep the liver and lights are boiled and then given to the dogs. Are the rest of the insides, stomach, intestines, etc., dangerous as regards hydatids?

LIVESTOCK DIVISION:—

It is very pleasing to note that you are doing your best to assist in the campaign against hydatid disease. The boiling of the liver and lights will go a long way to prevent the dogs from becoming infested with tapeworms. In fact, it may be stated that the boiling of these organs will prevent the dogs from becoming infested with the species of tapeworm which is mainly responsible for hydatid cysts in animals, and also from infestation with the species which is dangerous to the human subject.

In other words, although a type of hydatid cyst may be present in the other viscera of the sheep, i.e., stomach

and intestines, this cyst, if eaten, will give rise to tapeworm in the dog, but even so, the tapeworm thus caused is not dangerous as the vector of hydatid disease in the human subject. This type of cyst is also much more rarely seen than the type found in the liver and lungs of stock.

In summarising, therefore, the dangerous tapeworm is eliminated through your present boiling method, and the second tapeworm should gradually be eliminated through a continuation of regular dosing of the dogs, according to the programme you are following.

It is encouraging to know of such an earnest attempt to deal with the problem, and this office will be pleased to hear of your further success from time to time.

Cow With Infected Womb

"H.M.S.," Paparoa:

I had a cow due to calve in August. About a month before calving date, I found a growth protruding from the vagina, in appearance, or at least in shape, like a flat cauliflower, about as big as a saucer, otherwise the cow was quite normal and healthy. Acting on the advice ((by 'phone) of the local stock inspector, I tied a string round the neck of the growth and it eventually dropped off. The cow was ill for quite a while and must have slipped the calf. However, she recovered and is now milking. What I would like to know is: (1) Is the cow likely to breed again? (2) There is a discharge of foul smelling creamy liquid coming away frequently, can I do anything about this? (3) Would it be safe to put the bull to this cow, having in mind the possibility of him being infected or infecting the other cows?

Advisory Service on Veterinary Matters.

Farmers are invited to submit inquiries connected with the health of their stock, and the replies will be published under this heading.

Livestock Division:

It is very difficult from the history given by you to know the exact condition of your cow. It is apparent that the animal has a chronic purulent infection of the womb, and until all discharge has ceased it is not advisable to attempt to breed from the animal. An attempt should be made to clean away all discharge by regularly douching out the animal with a weak solution of Condy's crystals in water, or by using a salt solution of the strength of three tablespoonfuls to the gallon of water. All water used should be first boiled and allowed to cool to blood heat before use. All syringes, rubber tubes, and funnels should be clean and always kept clean. Douching may be carried out twice a week until all discharge has ceased.

Thereafter consideration should be given to breeding from the animal at a subsequent heat period. In the meantime the animal will have recovered a lot of her lost condition due to her illness.

The disturbing feature about the animal is that although you say the date calving was due was August you are not sure what actually took place. It is assumed the animal aborted, but there should have been some evidence of this in an animal so far advanced in pregnancy.

If possible, it is advisable for you to have the animal examined by a veterinary surgeon, and then be guided by his instructions.

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The soundest advice JOSEPH FORD can offer farmers is . . . "Take nothing for granted . . . protect against scour and unthriftiness and improve the general health and condition of your stock . . . use JOSEPH FORD'S COBALT DRENCH . . . *starving is not necessary* . . . and it can be given with perfect safety to ewes and lambs of any age or condition."
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Food Value of Oats

"W.S.B." (Woodville):

What is the difference in food value of Algerian oats crushed and uncrushed: 1. For horses. 2. For dairy cows. 3. For sheep, particularly ram hoggets. 4. Is there any truth in the statement made to the writer by an old North of Ireland farmer accustomed to cattle fattening there, that there is no necessity to crush or grind grain for any animals that chew the cud.

I am at present feeding dairy cows on oats, Algerians, uncrushed and notice that a good many oats pass through them undigested.

Livestock Division:

The composition or food value of oats is the same whether the grain is fed in a crushed or uncrushed state. The main point to be considered is whether it is more profitable to feed the grain whole or crushed, according to the class of animal to be fed. It has been recognised that some animals are more efficient in the mastication and digestion of whole oats than others. Even in the case of horses, where whole oats may be considered to be the natural food, some animals bolt the oats and much grain passes through in the droppings in a totally unmasticated and undigested state. In the case of horses with sound teeth, it is very questionable whether it would pay to crush the grain, as in such instances trials have shown that 94 lb. of crushed oats were equal to 100 lb. of whole oats. More efficient mastication of the grain may be ensured by mixing chaff or bran with the oats, and in trials under these conditions it was found that crushing the grain did not pay. Horses with poor teeth, aged horses, and foals will do better if the grain is crushed.

For dairy cows it is always recommended that oats should be ground or crushed before being fed. It is recognised that the grinding surface of the teeth of cattle does not provide such an efficient mill for the grain as do the teeth of horses.

The same remark applies to sheep, and particularly to ram hoggets. Crushed oats is a feed much relished by sheep, and although it is not recognised as a fattening feed for young sheep this class of animal grows well on a concentrate ration containing oats.

Horse With Greasy Heels

"F.S.S." (Otaki):—

"Is there any cure for greasy heel in horses? Please advise if it is contagious and what treatment is necessary."

LIVESTOCK DIVISION—

While complete cure may be difficult to bring about, the condition can be greatly improved and kept in check by regular treatment.

Clip the hair closely off the affected area, wash thoroughly with soap and water, then dress daily for a few days with a lotion made with 2 ounces of bluestone dissolved in a pint of water. The addition of a few ounces of glycerine improves this dressing, but it is not at present obtainable. After a few dressings, the lotion need be applied only once a week, but the condition should not be neglected.

So far as is known it is not contagious, but certain strains of heavy hairy-legged horses seem susceptible, and it is aggravated by wet, dirty conditions.

Orchard Notes

December Work in the Orchard

CONTINUATION of spraying, as recommended in previous notes, should be attended to. Insect pests, such as codling moth and leaf-roller caterpillar, become troublesome during the hot, dry periods, and if not controlled cause considerable damage to both foliage and fruit. Lead arsenate sprays, 1½ lb.-100 gallons of water, should be applied at intervals of 18 to 21 days.

At this period, red mite usually becomes prevalent. If not checked, it will, at least, seriously debilitate the trees. Very often it checks development of the fruit and causes premature leaf fall. A close watch should be kept, and where the mite is found to be in evidence, Summer Oil spray, 1-100, should be applied to the trees, and repeated in ten days if necessary.

In districts where pip fruits are liable to become infected with glomorella, trees should receive a preventive spray of Bordeaux mixture, 1:2:50, plus spreading agent. For the control of brown rot, stone fruits should receive attention with lime sulphur, 1-150, plus colloidal sulphur, 2-100, repeated at fortnightly intervals up to 14 days before harvesting.

Cultivation should be continued and the soil brought to a good tilth. Shallow cultivation is all that is necessary, and the use of harrows is sufficient to maintain the tilth. It will also help to retain the moisture already conserved in the soil. If the soil is left in good condition before cultivation ceases, the preparation of the land for the sowing of a green-crop early in January will be simplified.

Green Manuring

Orchards are generally clean cultivated during spring, summer and early autumn—a system of soil management, which, although necessary for the conservation of soil moisture, leads to gradual but certain loss of organic matter or humus. Such loss must be made good by annual additions of organic matter. This can be achieved by ploughing under in late winter or early spring a large bulk of green stuff grown throughout winter between the rows of trees.

When a green crop is decomposed, the first six inches of the soil become enriched by the nourishing materials which the crop, during the period of its growth, drew from the air and from the lower portions of the subsoil. This material is now placed within the reach of the succeeding crop. During the growth of the plant, the soil has, in addition, been stirred up and disintegrated by the development of the roots. If sufficient moisture and warmth are present, the buried crop decomposes with more or less rapidity when ploughed under.

Green manuring is effective both in sandy and heavy clay soils, and, indeed, on all soils deficient in humus. On sandy soils, the effect of green manuring is to consolidate the soil, the humus formed binding the particles together. On clay soils, the effect of the addition of humus and the production of carbonic acid is to loosen and aerate the particles. When conditions as to warmth and moisture are favourable

and the crop decomposes fairly rapidly, the production of soluble plant-food proceeds with considerable rapidity.

Most important, however, are the facts that green cropping in some form or other is the only economic method of maintaining the organic matter of the soil on large areas, and that maintenance of organic matter is the most important single factor in orchard soil management.

In considering the crop to be sown it should be remembered that such leguminous crops as lupins, peas and vetches supply, in addition to organic matter, a considerable amount of nitrogen. Blue lupins have proved the most satisfactory green crops for most conditions and types of soil. These should be sown between early January and late February at the rate of 1½ bushels per acle. To obtain the maximum results it is advisable to sow a fertiliser with the seed. Superphosphate at the rate of 2 cwt. per acre is quite suitable for this purpose.

Harvesting Stone Fruit

At this period of the year, growers should have a pretty good idea of the crop prospects for the season. In preparation for the handling of the crop, the packing shed should receive a thorough cleaning up. Cases and trays should be made up early so as to allow the timber to dry out properly before being used. Where second-hand cases are being used, owing to the fact that spores of brown-rot fungus are likely to be lodged in cracks and crevices, growers should take the precaution of treating the cases by dipping them in a sterilisation liquid such as formalin solution (3 per cent.) or bluestone (1 lb. to 50 gallons water).

The time is approaching when a commencement will be made with the harvesting of the early varieties of peaches and plums. Every care should be taken by pickers, graders and packers in the handling of the fruits, as they bruise easily, and skin punctures may result in the entry of brown rot.

The distance the fruit has to travel before it reaches the consumer will, in a large measure, determine the stage of maturity at which the picking should be done. Fully ripe fruit bruises most readily and will not stand transportation. A slightly hard fruit may be worth something on the market, but rotten fruit is a loss to all concerned. At the same time, one should refrain from picking immature fruit. Size and pack the fruit well, and market specially selected samples in trays where this is convenient. There are outlets for all grades, and they should be kept separate for the purpose of diverting them in the proper channels.

Fireblight

A strict watch should be kept for the appearance of fireblight, and where infection is found it should be cut and destroyed as promptly as possible.

—A. T. DOUGLAS,
Acting District Supervisor,
Horticulture Division, Auckland.

Citrus Notes

Control of Scale Insects

WITH conditions expected to be more or less dry for the next few months, cultivation becomes more than ever an important feature in orchard management. Earlier cultivation should have dealt with cover crops and weed growth, while giving the soil a good working to fair depth.

Summer cultivation aims primarily at conservation of moisture, in order to maintain tree vigour, with consequent benefit to developing crops. This objective may be attained by regular, light cultivations, particularly following rain. Shallow cultivation is sufficient to control weed growth. At the same time it breaks up the surface and retards evaporation of moisture, without unduly exposing the humus contained in the lower soil layers to the detrimental effects of scorching summer sun.

Scale Insects

During the summer months, a number of scale insects, which attack citrus trees, pass through their most active growth and reproductive stages. The life cycles of different scale insects vary in detail. Some produce a series of broods in one season, while others have only one, which, however, may extend over a period of many weeks, owing to variations in rapidity of development between individual insects. In general, the habits of the various species do not differ widely, although, in a few instances, there is enough departure from average to call for specially-timed control measures.

All scale insects find sustenance by piercing outer tissues, and sucking plant juices from the hosts. Most of the soft scales exude honey-dew, which lodges on the branches, foliage and fruit, and, in turn, becomes the host for sooty-mould fungus. This causes the familiar sooty appearance so difficult to remove from fruit. Heavy infestations of trees by scales result, therefore, in debilitation of trees, sometimes even the killing of limbs through loss of sap. They may also cause an unattractive dirty condition of the fruit. Armoured or shielded scales are usually the more severe in their effects on tree vitality. Most soft scales cause sooty mould, though a somewhat less severe drain on the food supplies of the trees.

Seasonal Work

Continue orchard cultivation and handwork round trees.

Keep lemon harvesting up to date.

Watch for appearance of young scale insects, check up on borer activity, and treat bark diseases.

Continue light pruning of citrus trees, if not completed, but avoid heavy cutting as much as possible until next spring.

Citrus Red Scale

Red scale is the most destructive of the armoured scales in citrus orchards. Its devitalising effect, when present on trees in considerable numbers, is so serious that affected trees may frequently be picked out by the yellowness of their leaves. Several broods are produced in a single summer. Commencing as early as December, and continuing until March or April, they multiply exceedingly rapidly with each new brood.

The scales are very small, but adults are well armoured with a waxy outer covering which protects them from the effects of sprays. Young scales are of reddish-brown colour. They are circular, and almost flat, and grow slightly larger than a pin head. Older scales lose their bright colour, and usually become grey or brownish grey. Not infrequently, their presence on main branches, where they may have been established for more than one season, is indicated by a decided roughness of the bark.

During the winter, and until well on in early summer, most of the scales will be found on main limbs and smaller branches of the trees. Most of these scales will be adults, whose greyish colour blends with that of the bark, making them rather difficult to see. In summer and autumn, young scales commence to move on to leaves and

fruits, where they are more readily seen, and later cause fruit to be rejected.

Standard Spray

The standard spray recommended for control of red scale is any brand of certified Summer Spraying Oil at 3 gallons to 100 gallons of water. The time to apply this spray, and the number of applications, vary according to season and degree of infestation. In a commercially clean orchard, one with only very slight infection, a single application towards the end of February, or during March, will give satisfactory control, but, where scales have become more numerous, two sprays are definitely necessary. The first should be applied late in February, and the second towards the end of March or early in April.

The earlier spray will deal with young scales which have appeared at the beginning of the season, and will prevent most of them from reaching the fruit. It will leave many adults which will not yet have produced their young, but will have been too well protected to be killed by the spray.

The later application should aim at destruction of later broods and reduction of the carry-over to the next season. It should not be applied too early, because that would allow further hatchings of scales to escape treatment and survive until the following spring. Two well-timed spray applications will very greatly reduce infestation even on quite dirty trees.

Sprays for control of red scale should thoroughly wet all parts of the trees, but special care should be taken to cover main limbs and branches.

Other Scales

Careful spraying for control of red scale will deal effectively with most other scales, whether armoured or soft species. Soft scales, such as olive scale, commonly found on citrus trees, are more easily killed than the armoured kinds. Most of these soft scales are brown or black in colour, more or less hemispherical in shape, and about the size of a small lady-bird when full-grown. They frequent smaller branches and leaves rather than main limbs. In the absence of red scale on trees, treatment of the soft scales should be carried out before they reach maturity. The hard wax scale, one of those requiring special attention, will be discussed in later notes.

—I. L. NOTTAGE, Orchard Instructor, Tauranga.

Cool Storage Notes

Overhauling of Cool Storage Plants

As a number of the cool stores for fruit will be emptied comparatively early in the season, an opportunity will be afforded cool-storage proprietors to examine thoroughly their storage plant, equipment and chamber insulation, with a view to carrying out any urgent extensive repairs, or alterations that may be found necessary.

Electric motors, switches and wiring should be examined periodically, and the motor winding insulation cleaned of dust and dirt accumulations. The bearings also require attention at regular intervals (see article entitled "Electric Motors on the Farm" published in the August issue of the "Journal of Agriculture," page 97).

Other power units, such as Diesel engines, should be opened up, and all wearing parts, such as pistons, cylinders, bearings, valves, and valve seatings, should be carefully examined. Faults detected should be repaired, and parts which are showing excessive wear replaced.

The condensor cooling water pump should also receive a thorough overhaul, as this is a most important part of the refrigerating equipment.

Engineer's Job

The ammonia compressor, together with ammonia valves, spindles, gland packing and ammonia condensor, should be overhauled by a refrigerating engineer. The expansion coils should be cleaned of scale and rust and repainted with bitumastic or aluminium paint.

The insulation of the chambers should receive special attention with a view to repairing damaged timber or replacing faulty insulation. If the building is of timber, a careful examination of the foundations, flooring, timbers and insulating material should be carried out in order that faulty or rotting timber or dampness of the insulating materials may be detected.

In cool stores in which wet batteries have been in use for a number of years, a thorough examination of the brine-tank and its insulation may disclose extensive damage to the insulation from dampness or brine leakage. If the battery walls and ceiling are covered with malthoid, which is often used as a protection to the lining timber, an inspection may reveal a rotting condition in the timbers behind the malthoid covering. This is frequently caused by the condensation of moisture, and the consequent damp condition of the lining timbers. If dampness of the insulation or lining timbers is allowed to bring about rotting of the timber or insulating material, the atmosphere within the storage chambers may take up the musty smell, which frequently causes tainting of stored fruit.

Replace With Care

When replacing the insulating material great care should be taken in replacing the material which forms a seal between the insulation and the lining timbers.

Chamber doors, and the seal between the door and frame, should be carefully examined, as the material which forms the seal may have become damaged and require replacing. Door fasteners and hinges should also be examined, as broken parts of fasteners should be replaced and hinges repaired and lubricated.

Faulty flooring timber in packing-shed floors should be removed and replaced.

All decayed fruit should be removed from the chambers, and the packing-shed and floors should be cleaned of refuse and dust accumulation.

The roofing material of the cool store and packing shed should be examined occasionally for loose nails or screws, and the spouting and drain pipes should be cleaned out, examined and repaired if necessary.

—A. A. POWELL, Cool Storage Officer. Wellington

Internal Parasites in Poultry

Mortality and sickness among poultry of all ages due to internal parasites such as worms, is becoming distressingly common, and greater attention will have to be paid by poultry keepers to guard against future losses. It would be safe to assume that these parasites infest almost every flock of poultry in the Dominion to a greater or lesser degree and are more responsible for unthrifty flocks and low egg yields than any other cause.

"Internal Parasites in Poultry" is the subject of a special bulletin issued **free** by the Department of Agriculture. This bulletin deals with the various types of worms and gives methods of treatment. Write to the Department of Agriculture, Auckland, Wellington, Christchurch or Dunedin for a copy.

Guide for the Home Garden

Work in the Home Garden for January

VEGETABLES for victory, vegetables for health, and vegetables for nutrition, are trite phrases at the present time, but a higher estimation of the potential value of vegetables which may be produced in the home-garden is necessary as a stimulant to greater production.

Statements recently made by responsible men holding high positions in public life—no doubt after careful deliberation of all the relevant facts—seem to indicate the necessity on the part of everyone fortunate to be able to grow vegetables, in whatever degree, to make as his goal, the limit of organised and planned production.

A start having been made with the rationing of primary produce, it is reasonable to assume that, perhaps, further action may become necessary. In anticipation of such an eventuality, a plentiful supply of fresh vegetables from the home-garden can be considered very appropriate.

Attempt Needed

Specialisation by commercial growers in the production of certain crops, particularly in areas where favourable conditions obtain, may be desirable, but in the home-garden—as far as it is practicable—the production of a nutritionally balanced variety of vegetables should be attempted.

Complaints concerning unsatisfactory germination owing to poor seed, particularly of carrots and peas, are plentiful. While there may be a certain amount of justification for these complaints, improvement in methods of seed-sowing and plant-growing may, and in some instances would, result in considerable improvement.

Owing, unfortunately, to uncontrollable circumstances,, many home-gardeners find themselves in the unfortunate position of being short of late-summer maturing vegetables. Supplies, however, for late autumn, winter, and early spring should be aimed at without delay. If plants of the cabbage family have not been grown, they should be obtained and set out as early as possible.

For most districts early and late savoy cabbage plants may still be set out, and in favourable locations, parsnip seed may be sown, and an excellent crop assured. Leeks, too, can be planted and the seed of swedes and main crop carrots sown.

Tomatoes

In view of the exceptional demand which is more than likely to obtain for the supplies of tomatoes that may be available for market, home-gardeners would be well advised to make strenuous efforts to produce tomatoes to supply at least their own requirements. January is a critical month for the plants, especially if humid weather conditions prevail.

Two practices should be especially guarded against—(1) The use of too much compost and (2) The application of over-doses of inorganic nitrogenous fertiliser.

Instances have been recorded of disastrous results following such excessive manuring. A vigorous, growing plant with a heavy stem and heavy dense, soft foliage is produced. Such a plant becomes an easy victim to disease, and, once stricken, it has rarely any chance of recovery. During the pre-picking stage, tomato plants should never be forced with manures or fertilisers. Steady, balanced growth between stem and foliage should be aimed at, and the plants kept well sprayed with Bordeaux mixture.

If it is considered necessary, the large broad leaves below the first truss of fruit can be removed. This will permit a greater circulation of air at soil level, and admit spray to the lower part of the plant. All surplus growths should be removed whenever observed and the plants kept tied to the stakes.

Lettuce

Recent unfavourable weather has been responsible for neglect in production of this necessary vegetable, and now, during an anticipated period of warm, dry conditions, growing may be difficult. Unless plenty of water is available, and handy for application,

it may be better to sow seed in rows in the open garden. Subsequent thinning, if done with a sharp knife, need not disturb the plants allowed to remain. Plenty of water and liquid manure are necessary to produce a quick-growing crisp lettuce.

Onions

This crop should never at any time be allowed to become weedy, more particularly as maturity is being reached. Damp conditions accentuated by weed-growth round the bulbs create and maintain an unfavourable environment which tends to prevent proper ripening of the bulbs. Further applications of manure in any form are unnecessary, and water, if applied at all, should be applied with caution.

Peas

Although weather conditions in some districts may be considered too dry for good seed-germination, an effort should be made to obtain what may be the last crop of the season. For many home-gardens, pea production has been disappointing during the past few months, and in estimating the chance of a short autumn, seed of a dwarf variety—William Massey—may be sown. This variety is reported to be quick in reaching maturity. Copious watering in the early stages of growth will be necessary.

Brussels Sprouts

If, at present, no vacant space is available in the garden, good plants of this variety of winter vegetable may be planted between the rows of potatoes not yet dug. In large gardens, where enough of the vegetable-growing area can be spared, brussels sprouts may be grown with advantage. This vegetable is valuable for the vitamins it contains, and the fact that only about 5 per cent. is non-edible compensates in a marked degree for the lighter crop produced when compared with cabbages. It is also resistant to frosts, and is very largely grown in Great Britain, where it is much valued for its superior flavour.

Broccoli

Next in importance for holding over winter and into early spring, broccoli should be considered. Plants may be set out in the same way, and under the same conditions, as brussels sprouts. A late-maturing variety should, however, be planted. This plant, too, is bred to stand hard frosts successfully, but where these may be of exceptional severity, it is desirable to tie the large outside leaves together loosely near the tops. This will protect the developing curd which, once injured, quickly deteriorates and becomes unfit for human consumption.

Borecole Kale

It is safe to say that no member of the cabbage family will stand more severe weather than kale. Unfortunately, it is not as largely grown as it should be. Because of its nutritional value and hardiness, its production is being specially encouraged among British home and commercial producers. Its long, curved, curly blades can be cut as required, and no more than is necessary may be removed from the plant at one time.

The last three vegetables referred to will require considerably more space than can possibly be spared in most home-gardens. Planting distances vary. Rows may be spaced 24 to 30 inches apart, with 18 to 24 inch spacing between plants in the row.

Protection of the plants from the attacks of aphides and caterpillars by dusting or spraying will be necessary. Incidental periods of warm, dry weather will induce attacks by these pests, and the insecticides mostly used to combat their depredations are nicotine sulphate, arsenate of lead, and derris. Before using these, the directions for application which accompany their sale should be studied and complied with.

Carrots

Where production is difficult, it may be advisable to sow only small quantities of seed at stated intervals and

harvest the carrots when young and tender. Compensation for the extra labour involved and the loss between this stage and maturity will be found in the extra nutritional value which the young product contains. From early February and a little later—in favourable locations—carrot seed may be sown and good results obtained. For success with this sowing, two precautions must be observed:—

1. The sowing should be made as far away as possible from any other carrots which may be growing in the garden.

2. The bed must not be on a part of the garden which was recently occupied by carrots. Any matured carrots growing in the garden should be dug and stored and the ground deeply dug.

Parsnips: The bed for this crop should not adjoin the carrot area as the rust fly also attacks parsnips.

Celery

Early plantings of celery should be growing well. The humid weather which obtained in many parts of the North Island has been conducive to good growth, but it has also induced attacks of early and late blight. The most effective means of preventing loss from these diseases is by spraying with Bordeaux mixture. Celery grown in trenches does not require to be blanched by any artificial methods. Plants grown in beds may be blanched by tying paper or cardboard round the ribs. Whatever material is used, the plant should be wrapped 12 to 14 inches high from soil level. Old boards may be used and kept in place with pegs or pieces of heavy wire pushed well into the soil. The boards should stand on edge close to the outside row of plants. This should be done 14 to 18 days before harvesting.

"Paranaph"

As the insecticides referred to earlier in these notes are high in cost, and in short supply, the following particulars are given for the production of "Paranaph." This insecticide, as a result of much experimental work, was first prepared by Mr. Herbert H. Cousins, M.A., F.C. "Green Fly, Aphis, and White Fly—all the common sucking insects of the aphis type," he states, "can be readily destroyed with "Paranaph" at a strength of 1 to 1½ per cent. or 5 to 8 ounces to 3 gallons of water. Use soft water if possible.

To Prepare Paranaph—"To 1 pint of water add 3½ lbs. of soap—soft soap is preferred. Simmer over a fire with constant stirring until all lumps have disappeared and a perfectly uniform melt has been obtained. Add 6 ounces of napthalene—refined—and stir until dissolved. Remove from the fire and add 1 pint kerosense. Stir until well mixed. The finished product should be semi-solid, and uniform in texture throughout.

"It can be used at various strengths for aphides, scale insects, fleas in buildings, and dogs. It is also a very effective grease soap for cleansing the hands after they have been soiled with oily grease from handling machinery."

The ingredients necessary to make the quantity indicated above can be purchased retail for about 4/-, and used at a strength of 2 ozs. to 1 gallon of water will cost approximately 1d. to 1½d. per gallon. In the home-garden it can be used for the destruction of aphides on all members of the cabbage family and other plants affected by this pest.

—D. K. PRITCHARD, Instructor in Vegetable Culture, Wellington.

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Seasonal Work for Beekeepers

Colony Management

THE main honey flow should now be in progress throughout New Zealand, and colony management will consist mainly of providing storage space for the incoming nectar which requires considerable room during the evaporating and ripening period.

Supering

There are various methods of supering and most of these have something to recommend them. When the honey flow has commenced in earnest, there are times when two supers of drawn combs could be given, but it is not always safe to do this, as a sudden change in the weather may result in a setback to colonies. It is therefore advisable to add supers singly as required.

Where foundation is being used, it pays to super the hives during the early part of the flow, as, once the flow begins to slacken, the bees are not so inclined to take to foundation, and poor combs may possibly result. Unless the flow is heavy, the bees should be encouraged to start work on foundation. Under average conditions, it is a good plan to alternate combs of honey in the supers with frames of foundation, or else two combs of honey can be removed from the upper brood chamber and placed on either side of a super of foundation which is set above the brood chambers. The space left in the upper brood chamber is filled with the two spare frames of foundation.

The extent of the honey flow, and weather conditions, must be considered when colonies are being supered. Should hives be over-supered, particularly when the flow has passed its maximum, there is a likelihood of honey being scattered throughout the supers, resulting in difficulties during extraction entailing much work for little return.

Top v. Bottom

Some beekeepers practise bottom supering, while others tend toward the more recently advocated top-supering system. This is a matter that will have to be decided by individual beekeepers as seasonal conditions and locality should indicate which method gives the best results. In an average season, when normal weather conditions prevail, top supering will give just as good results as bottom supering. As considerable work is entailed where the supers of honey have to be removed in order to add more combs, it would be well worth while for beekeepers who practise bottom supering to try the top supering plan on part of their apiary for the purpose of comparing results.

When supering colonies that are below average strength for this time of the year, top supering should always be adopted, for unless a hive is strong in bees, placing a super of empty combs between the brood and the honey already gathered may result in the bees storing in the brood chamber instead of the supers, thus preventing the normal laying of the queen, with the risk of swarming or supersedure.

Introducing Queens

Queen breeders in most districts during the present season have experienced unfavourable conditions for the production of queen bees. Beekeepers who obtain their requirements from these sources will probably

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2. Alternate Tyres Regularly
3. Match Duals Carefully
4. Check Alignment Weekly
5. Load Properly
6. Drive Cautiously

GOODYEAR TYRES

receive their queens later than usual. Likewise beekeepers who raise their own queens will be faced with the same delay. A review of the various factors which influence the bees to accept or destroy the queens introduced to them by the beekeeper may be helpful at the present time.

A knowledge of conditions favourable to the successful introduction of a queen into a hive of strange bees is necessary when dealing with insects which react in various ways under different circumstances.

Introduction is accomplished with far more certainty of success if some nectar is coming in at the time, favourable periods being the spring, when colony strength is increasing, and early summer, during the honey flow, and in the early autumn before the gathering of nectar has ceased. When it is necessary to introduce queens at a time when nectar is not available from the fields, artificial feeding produces conditions more favourable to acceptance.

Colony Odour

Hives of bees appear to possess odours which are individual to each colony and its queen. Most systems employed in introduction are based on the assumption that the queen before being liberated from the introducing cage will acquire the odour of the colony that is to accept her. This may be achieved in as short a time as one hour but will certainly have occurred within twenty-four hours. It is possible, however, to have queens accepted, without considering colony odour, as, for instance, when bees are demoralised by smoking, and the queen is run in at the hive entrance, but the accepted methods which meet with most success appear to be closely connected with the influence of colony odour.

Nuclei, or weak colonies, are more likely to accept queens than are strong hives. In the evening, when the hives have settled down, and there is no likelihood of robbery, hives are in better condition temperamentally to accept a queen. If a queen is introduced to a colony that is being robbed even slightly, it is possible that the robbers within the colony will kill the queen as soon as she is released.

Brood Disturbance

Jay Smith, an outstanding American queen-breeder, contends that many queens are lost after being introduced because beekeepers, when killing the old queen, unduly disturb the brood nest and do not replace the frames in exactly the same order, with the possibility that the brood nest is divided by the misplacing of a frame or two of honey. With some hives, the result is that the bees in one half of the colony will accept the queen, whilst the other half builds queen cells, a queen from which kills the newly introduced queen.

A queen that is at the peak of her egg-laying capacity will be far more readily accepted than one that has been restricted in egg-laying, such as a queen confined for some days in a mailing cage.

Queens that are hungry are more acceptable to the bees, as they do not run about the combs—an action that seems to annoy the bees, but are concerned only with allaying their hunger.

Colonies that are short of stores are not in good condition to accept queens. They should be fed for a few days beforehand. Undue disturbance to hives immediately prior to introduction is not conducive to success. Seiving bees through an excluder to find the old queen, jarring the frames and all rough handling, tend to put the bees in a defensive mood, and introduction should be delayed until the bees have settled down. The younger the bees are, the easier it is to introduce a queen to them. After a queen has been introduced to a colony the hive should not be disturbed for seven days.

—R. S. WALSH,
Apiary Instructor, Auckland.

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Notes for the Poultry Farmer

Pullorum Disease or Bacillary White Diarrhoea of Chicks

PULLORUM disease, or "B.W.D." as it is often called, is primarily a disease of baby chicks. Fortunately, it has not become a scourge in New Zealand, and furthermore, when it has occurred, Pullorum appears to be milder in form than is experienced in, say, England or the United States. The fact remains, however, that this disease is existent in the Dominion, and might easily become firmly established, even in a more severe form, unless steps are taken immediately to bring it under control.

Can "B.W.D." Be Easily Recognised?

It should be clearly understood that poultrykeepers are **not** in a position to recognise or diagnose "B.W.D." among chickens. The disease may be suspected, but only a complete laboratory examination can determine beyond doubt the presence of "B.W.D." in a chicken. It will be shown later that this disease is also carried by adult stock, but here again it is impossible to recognise its presence in a bird while still alive on the farm. In fact, it is possible to have apparently healthy birds in full lay carrying the germs of this disease. Poultrykeepers should not attempt, therefore, to recognise "B.W.D." in either their chickens or laying birds. Even the presence of a white diarrhoea does not necessarily mean that a bird is infected.

When to Suspect "B.W.D."

"B.W.D" is caused by a minute organism, the technical name for which is *Salmonella pullorum*. With infected laying birds, it is usually found only in the ovaries (yolks) and in most instances has no serious effect upon the bird. With chicks, however, the germs may spread to many of the organs, with fatal results. Certain chicks will recover from an attack of "B.W.D." and often then retain the germs, which finally become centred in their ovaries.

Is There a Cure?

The answer is an emphatic—NO! Any attempt to cure infected chicks or adult birds is a waste of time and money.

How Infection Is Spread

The infection in the case of baby chicks comes through the eggs at hatching time. Laying birds whose ovaries are infected are referred to as "carriers," and during the breeding season a certain number of their eggs carry germs of this disease. If these germ-infected eggs are hatched, then the resultant chicks are infected with "B.W.D." organisms. Should these organisms multiply, the chicks are attacked by the disease, and in most cases die, but before doing so will pass droppings laden with germs. These droppings may, in turn, infect other healthy chicks, and so the disease is spread.

It has also been established that adult stock "carriers" pass droppings containing "B.W.D." germs, and in this way a gradual increased infection may develop among a laying flock. It should be noted, however, that the poultrykeeper will see no signs of the increased infection, and will be totally unaware of this growing trouble. That trouble exists will become obvious only when mortality among his baby chicks becomes excessive.

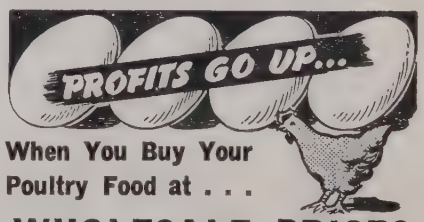
Control of "B.W.D."

As there are no means of curing either infected hens or chicks, it is fortunate that there is a satisfactory method of detecting "carriers," which are responsible for spreading this disease. Once detected, these "carriers" may be removed from the flock and killed for table purposes. They are in no way unsuitable for human consumption. "Carriers" may be detected by what is usually called "blood testing" the flock, and this test may be made in two ways:—

(a) For the first method it is necessary to have every bird to be tested leg-banded with a numbered ring. A small sample of blood is drawn into a glass tube from a vein in the wing, and a label on the tube is marked with the bird's number. Samples from each bird are forwarded to the laboratory, and the poultrykeeper is subsequently informed which numbers reacted to the test. The birds whose leg bands correspond with numbers given are then removed from the flock as "reactors," being, in fact, "carriers." This is known as the "tube test" method.

(b) For the second method, a large drop of blood is obtained from the comb or vein in the wing, and placed on a glass slide. To this blood is added a specially-prepared liquid referred to as "antigen," and within a minue or two the tester is able to say whether the bird is a "reactor" ("carrier") or not, according to the effect of the blood upon the antigen. This method is referred to as the whole-blood "rapid test." While satisfactory, this second method is not as accurate as the "tube test," but helps the poultrykeeper in that less labour is involved and no numbered rings are required.

Poultrykeepers are strongly advised to "blood test" their birds once an outbreak of "B.W.D." has been diagnosed among their chickens. It is the only satisfactory method known at the present time of controlling and eventually eliminating this disease.



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When to "Blood Test"

Assuming that an outbreak of "B.W.D." has occurred, the first essential is to blood test the breeding stock. This may be done **immediately** if the outbreak occurs at the beginning of a rearing season. In this way, further losses with chicks from "B.W.D." may be avoided during that season. Alternatively, all possible breeders for the following season may be tested just before the birds go into the annual moult. If the number of reactors proves to be high, then it is advocated that the remainder be re-tested after the moult to ensure the elimination of any reactors which failed to show up in the first test. This is the only effective way to control this disease.

Furthermore, it is a wise precaution to test, when on the point of lay, all pullets which have survived an outbreak of "B.W.D." This elimination of "carriers" at this stage appreciably lessens the chance of infection spreading among the adult stock. It is also strongly recommended that "blood-testing" be carried out for more than one year following an outbreak of "B.W.D." Poultrykeepers are warned that testing for one year only does not necessarily protect their birds from a further mild infection, which in time is likely to become serious again.

What to Do With "Reactors"

All "reactors" or "carriers" discovered by "blood-testing" are, in fact, a source of danger to healthy birds. For this reason, the Department stipulates that they must not leave the farm **unless for killing purposes.** It is obvious that, if sold on the market or direct to another farm, such birds could easily be responsible for starting a fresh outbreak of this disease. If they are retained on the farm after a test has been conducted, then it is equally obvious that they must be kept quite separate from the tested or

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healthy stock. Carelessness in this respect can easily lead to a re-infection of the non-reactors or healthy birds.

Precautions

Apart from blood testing, there are certain precautions which should be taken when "B.W.D." occurs among chicks:—

(1) Remove as often as possible all dead and sickly chicks from the brooders. These should be destroyed by burning.

(2) Change the litter at weekly intervals for the first three weeks in all pens where the disease has appeared. This litter should be burned.

(3) Drinking vessels and hoppers should be kept clean and disinfected frequently during the first three weeks. The use of caustic soda and boiling water is strongly recommended for this purpose.

(4) No chicks from an infected brood should be allowed to mix with other healthy broods.

(5) An incubator which has hatched chicks subsequently proved to be suffering from "B.W.D." should be thoroughly disinfected (see notes on fumigation).

(6) All chick boxes which have carried baby chicks subseqently proved to be suffering from "B.W.D." should be burned.

(7) Pullets surviving an outbreak should be treated with suspicion, as there are almost certain to be "carriers" among such birds. On no account should these birds be bred from, either as pullets or hens, until they have been "blood-tested." Such a practice would be helping to spread the disease.

Fumigating Incubators

There is ample evidence to show that "B.W.D." can be spread in an incubator during hatching time, more especially in cabinet incubators, where a fan is employed for forced air ventilation. Fluff and other dry material, which may be carrying disease germs, is distributed throughout the hatching compartment, and can in this way spread the disease to healthy chicks. To prevent this spread of infection, formalin (40 per cent. formaldehyde) may be used as a disinfectant at the time of hatching. Fumigation of incubators in this way is a method of reducing the spread of "B.W.D.," **but is not a satisfactory means of eliminating the disease from a farm.**

It is essential that fumigation should be carried out with care, and only when the poultrykeeper has a full knowledge of the correct procedure.

While the Department does not recommend that fumigation should be carried out as a routine practice, full details will be supplied on request to any poultrykeeper who wishes to use this method of control for "B.W.D." Evidence collected in New Zealand does not support the view that serious trouble from the spread of this disease in cabinet incubators is being experienced. This is probably due to the mild form of infection at present existent in the Dominion.

Where Help Can Be Obtained

Poultrykeepers are urged not to accept undue losses among their young chickens without requesting help from the Department. Where losses are heavy during the first ten days of brooding, about four or six dead chicks should be forwarded immediately to:—

The Chief Diagnostic Officer,
Animal Research Station,
Wallaceville.

A report upon the chicks will be supplied free of charge. Should this report state that the chicks died of "B.W.D.," then it is essential to consider "blood testing" all breeding stock involved. A request to "blood test" should then be made to the Superintendent of Poultry Husbandry, Department of Agriculture, P.O. Box 3004, Wellington, when particulars concerning a supply of antigen for "blood testing" will be forwarded without delay.

Don't

allow fowl manure to get wet. It becomes sticky and unworkable, and, in addition, loses much of its valuable plant food. Keep it in a dry shed and occasionally mix it with two or three handfuls of superphosphate.

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Federation of Young Farmers' Clubs

Wellington Y.F.C. Council

A MEETING of the Wellington Y.F.C. Council was held at Palmerston North on Thursday, October 14. Those present were Messrs. S. G. Avery (chairman), B. J. Collerton, C. J. Craig, G. McDonald and A. D. Young (Wanganui District Committee), E. Beazer, A. C. Buist, M. Donald, and A. J. Galpin (Manawatu), H. M. Poole and J. L. Sunderland (Southern Hawke's Bay), H. McKenzie (Wairarapa District Committee), W. A. Jacques (Massey College), and S. Freeman (acting secretary). Apologies were received from Messrs. L. Feierabend (Dannevirke), W. F. McLaren, N. Blatchford, and D. Buick (Wairarapa).

The chairman, Mr. S. G. Avery, welcomed delegates and members, and mentioned the recent annual general meeting of the federation, held on this occasion in Palmerston North. He thanked all members who had helped to make the meeting a success; also Massey College, the Plant Research Station, and the Seed Testing Station, all of whom had put themselves out to assist in providing interesting and instructive entertainment for the visiting delegates. He also referred to the steps taken by the Director of the Fields Division which had helped to overcome the difficulties in connection with the Wellington Council and district committee secretaryships.

Clubs in Recess

Mr. Avery said he considered the time was ripe to make a move in the direction of the resuscitation of some of the clubs in recess. The Dannevirke Club, as the sole surviving one in the Southern Hawke's Bay district, had, by invitation, sent delegates direct to the Council, and recently the Southern Hawke's Bay committee had been reformed through the revival of another club (Mangatainoka). Levin, the only club active in the Horowhenua area, had also been invited to send delegates direct.

He drew attention to the Auckland Council's proposal to investigate the possibilities of the revival of some of its clubs; a small committee had been set up for this purpose and a sum of money voted towards its travelling expenses for a drive in the autumn. He considered that, with the amount of funds in hand, the Wellington Council should undertake a similar campaign; funds accumulated could be used for no better purpose. It should be possible, by concerted effort, to revive some of the clubs in districts such as Taranaki, Manawatu, Central and Northern Hawke's Bay.

He mentioned two combined meetings of clubs in the Bay of Plenty which he had recently attended in company with Mr. D. S. Ross and the Dominion Secretary, Mr. Freeman; interest was being definitely held in this area by means of debates, competitions, etc. He considered that, throughout the Dominion, clubs should make every effort to be as active as possible under the conditions prevailing.

Younger Members

Younger members should be enrolled, and every endeavour made to hold their interest. They should be instructed in the correct procedure and conduct of meetings, and there should be discussions on the Y.F.C. Constitution. He questioned whether the aims and objects of the movement were known to many members. On the apparent difficulty of securing lecturers, he said that if club officials would look around they would find plenty among the farmers who were willing to give of their store of knowledge and experience. In the past, many units of the organisation had been prone to rely overmuch on the departments and colleges for lecturers. Assistance from such sources was now becoming increasingly difficult to obtain. He considered that the social side should not be neglected. With members going overseas, and others returning, there should be plenty of scope for social activity. The clubs' rolls of honour should be kept up to date, and club secretaries should make an effort to this end. He stressed the debt that, individually and collectively, the organisation owed to members who had gone overseas, and urged that those who remained in New Zealand should be prepared to make some sacrifice to keep the Y.F.C. movement active against the return of men from abroad.

Revival of Clubs

The acting-secretary, Mr. Freeman, gave a brief report covering the activities and general position of the clubs throughout the Dominion. Referring to the chairman's suggestion regarding the revival of some of the clubs, he reminded the meeting that while, approximately, two-thirds of the clubs in the Dominion were at present inactive, the position in the Wellington Council's area was appreciably worse—at the time of the annual meeting there were only 19 clubs left in the Wellington

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J.A.

area out of the original 85 active before the war.

Whole districts within the area had gone into recess, mainly due to apathy on the part of district committees. He felt that much could be done in the way of reviving clubs, but that in many cases it would be necessary to reorganise the district committees first. He referred to the formation of clubs in high schools and secondary schools as being a step in the right direction.

Arousing Interest

The matter of policy came in for a good deal of discussion. Many suggestions were forthcoming for arousing interest in the movement and reviving clubs in recess. Such matters as educational courses for junior members, and stock-judging competitions, were considered. A remit was received from the Wanganui District Committee suggesting that Massey College be approached in regard to the inauguration of short courses for junior members during holiday periods.

Mr. Jacques, on behalf of the college, stated that everything would be done to assist such an activity. After discussion, a committee was set up, consisting of the chairman, Mr. Jacques and the secretary, to go into the matters of length of course, period suitable, ages of members and other matters, the committee to have power to act. Mr. Beazer was of the opinion that in order to interest members, more attention should be given to stock-judging competitions. He mentioned the Feilding A. and P. Show, and suggested that interest could be stimulated by the holding of a competition there. Mr. McKenzie gave full details of a similar competition to be staged at the Wairarapa Show at Carterton.

Stock-Judging

After lengthy discussion, a resolution was carried to the effect that the council would do all in its power to revive and foster stock-judging competitions, and would be prepared to subsidise any such activities arranged by district committees, subject to prearrangement.

A committee, consisting of the chairman, Messrs. Collerton, Donald, Jacques, Sunderland and the secretary, was set up for the purpose of going into the matter of reviving district committees and clubs within the Wellington Council area, and the sum of £50 was voted towards the travelling expenses of the committee.

A sub-committee was also appointed to look into the matter of the Y.F.C. radio session from 2ZA, Palmerston North.

Affiliation Fee

Following discussion, a notice of motion was approved, to the effect that the Y.F.C. constitution be amended to reduce the affiliation fee to 10s. In order that the granting of some immediate relief could be considered by the Dominion executive committee, the following remit was carried, to be forwarded for approval or otherwise: "That until such time as the clubs generally are in a better financial position, half of the present affiliation fee of £1 1s. be returned to them by the federation."

The chairman referred to the passing away, last June, of Mr. W. G. Brownlie, who had been a tower of strength to the movement. He had been secretary of the Wairoa Club since its inauguration in 1936, and had occupied the positions of chairman of the Northern Hawke's Bay district committee, and vice-chairman, and later chairman, of the Wellington Council. He had been a regular attendant at Dominion executive committee meetings, as well as annual general meetings, where he would be sadly missed. In all his undertakings he had been extremely public-spirited, and had done a lot for the Y.F.C. movement.

Silent Tribute

At the chairman's request, the meeting stood for a few moments in silence as a tribute to Mr. Brownlie's memory.

The meeting closed with a vote of thanks to the chair.

As you know "making things hot" is the special function of most Speedway products. But right now our organisation is playing its part in "making things hot" for the enemy.

Both in New Zealand and overseas thousands of Speedway ranges, steam boilers, electric cylinders and oil burners are doing duty with the armed forces. Practically all our present output is "earmarked for Victory" and must go where it can best help the Nation's war effort.

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5

Reports On Club Activities

WESTERN SOUTHLAND.

Dipton.—Debate with Farmers' Union. Subject, "Is the Farm an Ideal Place to Rear a Family?" The teams were: Farmers' Union, D. H. Milligan (leader), R. A. Palmer, C. W. Mackintosh and W. McKae; Y.F.C., W. King (Leader), I. Ballintine, W. Davey and E. Shuttleworth. The judge, Mr. W. Mayer, awarded the decision to the Farmers' Union team. W. King gave a comprehensive talk on the field day held recently at Bluff. There was an attendance of nine members at the meeting.

Orepuki.—One new member enrolled. Messrs. T. McPherson and W. Pollard (local members of the Farmers' Union), gave interesting demonstrations on the different rope splices and the various knots used on the farm. At the previous meeting a discussion took place regarding the Lincoln College scholarships. Pte. W. Latchford, at present on furlough from the Middle East, told of his experiences on the battlefield, and showed some interesting snaps on farming in Greece. Able Seaman Steve McKenzie, from H.M.S. Leander, also gave an interesting account of his experiences. The attendance at the two meetings was 18 and 17 respectively.

SOUTH OTAGO.

Warepa.—Discussion on the remit dealing with "cultural and aesthetic values." Members felt that their tree-planting operations and the revival of the local public library are definitely in accord with the ideals expressed in regard to beautifying surroundings and developing existing facilities. Notice given of the South Otago Y.F.C. district committee meeting. E. Milligan, a member of the club, spoke on "Timber," and the points dealt with included the calculation of superficial feet, how to estimate the timber required for a small shed, the necessity for, and the laying of, damp-courses, where building permits are necessary, and the particular kinds of timber used for various purposes. An article, in the September issue of the Journal of Agriculture, dealing with the rat menace, gave rise to some very interesting discussion. There was an attendance of 11 members.

DUNEDIN.

West Taieri.—Final arrangements for running fortnightly dances. Decided not to hold a social this year. Debate to be held at next meeting. Lecture on "Seeds" by Mr. S. H. Saxby, Department of Agriculture. Twelve members present.

NORTH OTAGO.

Enfield.—Talk by Mr. J. Nimmo, a local farmer, on "Ploughing and Plough Setting." The speaker dealt with the ordinary two or three furrow plough, and being in former years a keen ploughman himself, was able to give some useful hints and tips on "match-ploughing." There were ten members present.

MID-CANTERBURY.

Ashburton.—H. Bennett and S. Watson gave very interesting reports on the annual general meeting of the federation held recently in the North Island.. A long discussion took place in connection with a pamphlet on waste rubber. It was decided to arrange for a collection by school children, with the depot at the school, members of the club to be in charge. S. Watson and H. Bennett are to represent the club on the stock-judging committee, to arrange the stock-judging competition for the Farmers' Union shield. Sixteen members present out of a total of twenty-three.

Hinds.—Lecture on "Cattle Judging" by Mr. G. H. B. Lill. Ten members in attendance. At the previous meeting, the total club membership, to the number of sixteen, attended for the impromptu speech contest for the Simmons Cup. The contest was judged by Mr. D. M. Bruce, who gave the awards as follows: R. Cocks 1, W. Taylor 2, A. McKenzie 3.

Methven.—Two new members enrolled. Report by A. McKay on the A. and P. Association's last meeting. He stated that club members were invited to act as junior judges at the next annual show in 1944. R. J. Low gave a report on the district inter-club stock judging day, to be held at Longbeach in the near future. A. McKay stated that it would be necessary to hold the pasture-judging competitions as soon as possible. The proposed Y.F.C. Memorial was discussed, a motion being passed to the effect that it was considered to be almost impossible for the club to raise its quota. Mr. R. H. Bevan, of Lincoln College, gave very useful instructions on the running of the proposed pasture-judging competition, after which he gave an instructive lecture on crops and pastures at the college. He also outlined the field days which the college authorities intend to hold in the near future. Thirty-one members were present.

CHRISTCHURCH.

Ellesmere.—Report and Balance-sheet of club dance; credit of £2 11s 9d. An invitation was received for members to attend field days at Lincoln College. Mr. J. G. McKay, Department of Agriculture, gave a talk on "Roots and Small Seeds"; he also exhibited slides showing manurial trials with lucerne. There was an attendance of 22.

St. Andrew's College.—One member of the club making application for Y.F.C. Lincoln College scholarship. Club members to attend a field day at Lincoln College. Mr. Gardiner, the club's advisory member, gave a talk on "The Experiences of a Canterbury Farmer." There were thirty-seven members present. At the previous meeting, Dr. Page, analytical chemist, Woolston Tanneries, addressed the meeting on "The Future of New Zealand Industries."

HOROWHENUA.

Levin.—Two new members elected. Arrangements for club dance. Address by Mr. G. H. Holford, Department of Agriculture, on "Serpentine Super." Twenty-six members present. At the previous meeting, one new member was enrolled. Three delegates appointed to attend meetings of the Wellington Council, as the district committee was not functioning. Talk by Mr. W. Stroode-Penny on "Repairs and Maintenance of Farm Machinery." Sixteen members attended.

MANAWATU.

Bunnythorpe.—Arrangements made for Y.F.C. section at the Women's Institute Show. J. Gore appointed as acting-chairman for the next meeting. A short address on "The British Navy" was given by Mr. B. Neylor. There were ten members present.

Rongotea.—Arrangements for club social. Club meetings to be held over until February, to avoid the busy season. Talk by Mr. L. H. Yarrall on "Gardening and its Origins." Attendance of twelve members. At the previous meeting, Mr. Gould spoke on "Travelling in the Mediterranean."

WAIRARAPA.

Carterton.—One now member enrolled. Decided to hold a club debate. Instructive talk on "Sterility" by the local veterinary surgeon. Twenty-two members present.

Masterton.—Report and balance sheet for club dance; net profit of £12 13s 11d. Discussion as to how the club's birthday should be celebrated. Judges appointed in connection with the short talk competition for the Falloon Cup. Mr. J. Heffer gave an interesting and instructive talk on "General Finance"; he fully explained the procedure for obtaining letters of credit, overdrafts and mortgages, and what may be offered as security for these. Attendance of thirty-three members.

WANGANUI.

Taihape.—Discussion on the national essay competition. Decided to hold a dance in aid of the parcel fund for members overseas. Impromptu speeches by members to be given at the next meeting. Address by P. Kearins, Jun., on the importance of keeping the young farmers' clubs' organisation on a firm basis till the war is over. Ten members present.

SOUTHERN HAWKE'S BAY.

Dannevirke.—Short report on the Wellington council meeting by the secretary. Short talk on "Afforestation" by J. Welsh. Mr. L. Feierabend explained the correct procedure and proper conduct of meetings. The club took advantage of an invitation extended by the Dannevirke District Jersey Cattle Club, and attended their 21st anniversary celebration. An interesting evening was spent, films being shown by Mr. Dawick, secretary of the N.Z. Jersey Cattle Breeders' Associaion. After a number of short speeches, the evening concluded with supper. Twenty club members were present.

TE KUITI.

Otorohanga.—Final arrangements made for club's birthday dance. Interesting address by Mr. J. F. Trapski, a local solicitor, on "The Soldiers' Settlement and Land Sales Bill." Salient features of the Bill were pointed out, and a number of questions by members were answered. There was an attendance of twenty-one out of a total membership of thirty-one.

Paewhenua.—Interesting talk on "Farming in Australia" by Mr. F. Pinfold. There were sixteen members present.

BAY OF PLENTY.

Omokoroa.—Ten members present at a meeting held to consider the revival of the club. Officers were elected as follows: Advisory president, Mr. H. A. Gardner; chairman, A. King; secretary, J. Haggart; treasurer, G. Matthews.

Paengaroa.—One new member enrolled. Mr. T. Revel gave an interesting lecture on the different types of caterpillar tractors that have been on the market. He described their capacities for work, giving examples. Attendance of twenty members and eleven visitors. At the previous meeting four new members were enrolled. Final arrangements made for the annual dance. Talks by Messrs. Wildbore and Melville on "The Care of Harvesting Machinery" and "Sheep Farming in the MacKenzie Country," respectively. Twenty-four members present.

Address of Organising Secretary

CLUB Secretaries are requested to note that the Dominion organising secretary (Mr. S. Freeman) is now stationed at Palmerston North. General correspondence, and matters such as reports of meetings, should be addressed to him, c/o Department of Agriculture, P.O. Box 112, Palmerston North.

As before, all orders for stationery, badges, and correspondence in connection with Journal subscriptions and affiliation fees, should be addressed to the Organising Secretary, Young Farmers' Clubs, P.O. Box 3004, Wellington, where they will receive attention.

Failure to attend to these instructions will lead to delay, as while the secretary is carrying out other duties at Palmerston North, he still deals with general correspondence and attends to reports for this section of the Journal. All the accounting is still carried out at the Wellington office.

Incidentally, club secretaries can assist by sending in their reports as soon

as possible after each meeting or other club activity. Where the District Secretary is still available the reports should be sent through him; where, however, there is no Fields Officer acting as District Secretary, the reports should be sent in direct to the Organising Secretary, P.O. Box 112, Palmerston North.

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Health Notes for the Farm

The "Store-Teeth" Habit

Contributed by the
DEPARTMENT OF HEALTH

IT was an American visitor who recently passed the remark, "Why do so many New Zealanders have store teeth?" People with expensive artificial dentures might resent the implication in the expression "store teeth," but no one can deny that a first-class set of natural teeth in adult New Zealanders is something you seldom see.

The country's reputation for faulty teeth is well based—we literally condemn ourselves out of our own mouths. The trouble, of course, is largely due to diet, and while we cannot do anything about those of us who have artificial teeth, we can see to it that our children have every chance of having, and keeping, good sound teeth. There are so many things that must be done by way of diet.

In the first place, we must provide the material of which the teeth are made—that is, calcium or lime and phosphorus; then we must provide the builder, vitamin D, which makes the calcium and phosphorus into strong teeth; thirdly, we must develop the jaw and gums, and make the teeth grow straight; we must discourage the children from eating foods that promote decay; and most important, we must keep the teeth in regular repair.

Daily Milk Rations

The best food for providing calcium and phosphorus at the same time is milk. Nothing can quite take its place in this respect. Up to the age of two years, one and one-third pints of milk should be given every day, and from two to fourteen years 1¾ pints a day are advised.

This may sound a lot of milk, but you can cut down the actual quantity to be taken as straight milk by using dried skim milk for milk puddings, white sauces, milk soups, and hot drinks, such as cocoa. Children of school age, of course, get half a pint a day. That counts in the ration. One and a quarter ounces of cheese would supply quarter of a day's calcium need. If the children take their lunch to school, sandwiches of wholemeal bread, cheese and celery, or any type of cheese sandwich, are easy to make and are wholesome.

Fish-Liver Oils

When it comes to vitamin D, this builder of strong teeth is found in fish-liver oils, and, of course, exposure to the sun will enable the skin to manufacture its own supply of this vitamin. To make the teeth grow straight, the chewing type of food is necessary. Raw celery, wholemeal bread, and raw carrots are excellent for developing the jaw properly.

Healthy gums are important. Gums that show a tendency to bleed freely are definitely unhealthy. The task of helping to make sound gums belongs to Vitamin C, the anti-scurvy vitamin, which is found in the green leafy vegetables, and in black currants, orange and grape-fruit juice, and in tomatoes, whether fresh or tinned. The humble potato has this vitamin too. For the very young the juices of oranges, tomatoes and swedes—and best of all, rosehip syrup—are the most valuable.

Firmness Counts

When it comes to discouraging the young folk from eating cakes and gummy sweets, especially between meals, you have a bit of a job, but parents must be firm. These foods stick in the natural pits of the teeth, and enable enamel-destroying bacteria to breed.

Finally, the children must clean their teeth after every meal, or at least twice a day. Without this regular practice, the most careful diet will be in vain. It is also advisable to start sending the children to the dental clinic, or to a dentist, at two and a half years of age, and to follow this up with regular, systematic overhaul every six months.

There are many things to think of, so much to plan, but it is worth it all to have New Zealanders known by their fine natural teeth rather than by their "store" teeth.

To remove rain spots from stockings without washing them, hold the toe in one hand and the heel in the other, and draw backwards and forwards through the steam coming from the spout of a boiling kettle.

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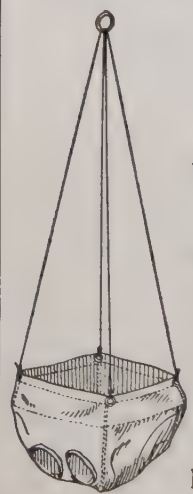
B112 DROPSIDE COT
Made of all wood, stained or enamelled. Dropside is held up beneath the cot. Makes it impossible for the child to let it down.



B126 BABY SWING
Strong white duck, with hanging cord, free from splinters. Will keep baby happy and safe.

B132 CHILD' PLAY PEN.
Wooden Play Pen, 4 ft. x. 3 ft., folds flat when not required. Has coloured beads on side for amusing baby. Can be used as clothes drier.

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THE GOOD NEIGHBOUR.

OUTSIDE my window there is a red, red rose in bloom, and I have been stealing its fragrance as I leaned out of my window in the cool of the early evening. It is fun watching the lights of Wellington wake up one by one—they come on gradually at first and then the street lights go on all at once and the dusky city turns into a glowing fairyland at my feet.

And while I have been watching all this magic I have been thinking long thoughts, and very happy thoughts too, about everyone of you, and the joy we have had through sharing our thoughts and ideas, our hopes and dreams in these pages through the year. I feel I have gained an immeasurable amount of understanding through having known you all, and now that Christmas is almost with us, and there is a New Year waiting just round the corner, I feel I must thank you more than words can say for the splendid co-operation you have given me, and for those friendly and lovable letters that have found their way into my mail bag.

Christmas once again, and still we have not heard the longed-for peace bells. But the day is nearer, and what a day it is going to be for us one and all. Many of you I know will feel particularly sad when that glad day arrives, because of the dear absent ones who will never return, but rejoice nevertheless with the glad news when the time comes, for it will surely mar their happiness a little to find a sad face on that day of days. Do you know the inspiring words of Richard Strauss's "Morgen?" But you may know it better under the title of "Tomorrow."

"And oh, the sun will shine again tomorrow!
And still my feet along that path will lead me
Where we, the happy ones, shall be united
There in the fragrant pinewood's sun-breathing centre
And to the shore, the wide-flung, blue horizon
Speechless and slow, we shall go down together—
Deep in each other's eyes will look in wonder,
While on us sinks our rapture's helpless silence."

Greetings To You All

When the year is dying do you feel a little miserable? It is a tendency that is apt to become a habit, and I do want you to overthrow it, because there is nothing to be miserable about really. It makes us a little sad to think back on the happy times we have had during the past year perhaps, and to think back to the friends we knew who perhaps we shall not know again, but remember that the promise of tomorrow is always ahead of you, and that tomorrow is going to be every bit as enjoyable as today, if not even more so.

THOUGHT FOR DECEMBER 26:

This day I devote, each and every December, to thinking of friends I forget to remember.

It depends on you—don't forget that, because it is one of the greatest essentials to lasting happiness.

And so, here we are at the gateway that divides this year from next year. I send you the evergreen wish for a happy Christmas, and for the New Year this thought: make it your creed for the year ahead and you shall not know loneliness or sadness again.

"I shall pass through this world but once. Any good thing that I can do, or any kindness that I can show to any human being, let me do it now, for I shall not pass this way again."

Off you go then, in your search to make someone happy, and don't procrastinate; do it now.

May the New Year bring you sunny days in sun-'it ways is my wish for you.

Mary

The Mistletoe Mystery

MISTLETOE, which can now be grown in pots, is one of the mysterious associations of Christmas. Like the Yule log and the giving of presents, it probably belongs to the pagan side of the great festival. For in the early days of Christianity the church was forced to incorporate a number of pagan observances in its feasts.

This possibly accounts for the ancient ecclesiastical ban on mistletoe, of which something has been heard even in recent years. But in spite of this the mistletoe which played so large a part in Druid rites, also has its association with the Holy Land. It has been gathered from olive trees in the Garden of Gethsemane.

Mistletoe, contrary to the general belief, is rarely found on the oak. The apple tree seems to be its favourite home, and it is also found on the poplar and willow. There is also a red variety of this strange plant.

Nativity

Softly go the winds tonight;
Like trees slow-blossoming the air—as sweet.
The starlight falls in little gleaming pools,
That splash my baby's feet.

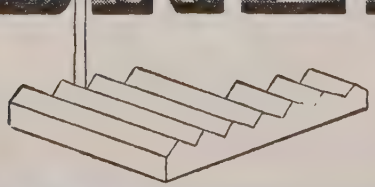
Now joy, untrammelled, laughs at strife,
And loveliness is earth's—exquisite, rare,
As when o'er Bethlehem the midnight stars
Shone on the Baby there.

Oh may my child, like Mary's Son,
Be kept in wisdom and simplicity,
Fearless, swift to challenge wrong, yet friend
To ev'ry bird and tree.

—ENID B. V. SAUNDERS.

When to-day's bomber becomes to-morrow's luxury liner of the air, peace and plenty will return to the earth. Until then it is our civilian duty to do without. To-day the Onehunga Mills are weaving for war, for the men who deserve the best in rest and relaxation. If you cannot buy your full requirements of Onehunga blankets, remember that the day will surely come when they will return to active service in your home, to provide you once again with peaceful sleep.

ONEHUNGA



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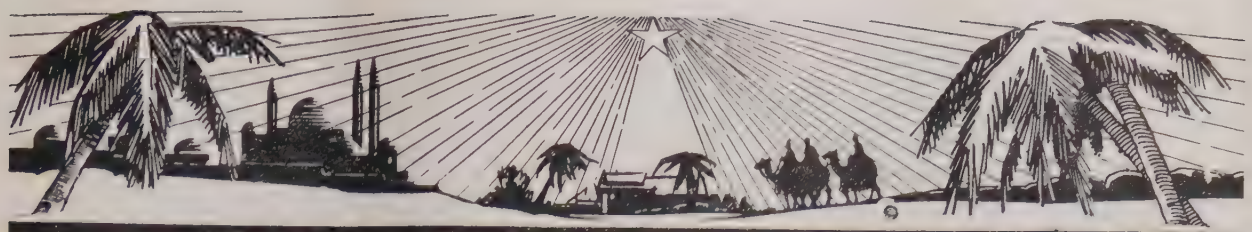

Gold and Frankincense

—By—
DOROTHY JESSON

THE organ poured forth long, slow notes which echoed and re-echoed till their reverberations seemed to fill the church. To Dahlia Jackson, sitting alone in one of the stiff-backed pews, it brought back memories of when she was very small. Sometimes childhood seemed a long way off, but always at Christmas time it seemed very close. Perhaps it was because the ritual was always just the same, it had always been the same since Dahlia could remember. She and Persis would wake up at the first hint of grey dawn and lie snugly in their beds, watching in a fascinated silence as the dark bulging outlines of their stockings would show up against the greyish square of window. And later, when Reggie arrived on the scene, what fun it had been to see his baby stocking hanging between their two.

Yes, they had always had great fun at Christmas time, but things would be different this year, she thought ruefully. Well, it would be a change anyway. She remembered how she had slaved and toiled last year—they had been short-handed in the ribbon department on Christmas Eve. And mother hadn't been very well either, but they had managed somehow. With the help of Persis and Dahlia in the evening, all the customary Christmas baking had been done, the presents bought, tied up and delivered as usual, the decorations hung and the tree dressed. As mother said, it wasn't as if it was just themselves. They had to consider cousin Sarah and Uncle Robert: living all the year round as they did in boarding-houses, this was the only family reunion they could look upon as their own.

But this year there were to be no celebrations, no Christmas dinner. Everyone had been so done in after all the rush and bustle last year, that the "pact" was arranged. They had all solemnly resolved that next Christmas there would be no bustle, no rush, no Christmas dinner, no Christmas presents even. She heaved a sigh. It sounded a good idea, but Reggie, who was only seven, would miss Christmas.

The clock in the church tower boomed out the three-quarter hour. Dahlia woke from her reverie with a start. The organ had ceased, and she was quite alone in the church. She couldn't think what impulse had led her to spend half her lunch hour listening to the organist practising Christmas hymns, but it had been so peaceful and quiet after the bustle of the outside streets, and she certainly did feel rested. Only this half-hour alone in the dim church had made her feel uneasy about their Christmas plans. After all, it might sound all right to say you would cut out all the cooking and baking and work, and just take lunch and spend a day in the sunshine at one of the bays. Loafing about on the beach, eating ice creams, swimming lazily in the sparkling water—but somehow it didn't seem right. And to cut out presents! She thought vaguely of the origin of Christmas. She seemed to see the three Wise Men riding solemnly through the purple night towards the large, bright star shining over the humble Bethlehem stable. And they had carried with them their gifts, the best they could afford—gold and frankincense and myrhh. The best they could afford and given with love and adoration. Weren't we, in the twentieth century, she thought, somehow losing the Christmas theme?

Dahlia roused herself, and rose rather unsteadily in the pew. It was high time she was getting back—Old Yorky would never forgive her if she was late on this busiest day of the year.

* * *

Fairyland may exist all the dull year round between the covers of a story book, but on Christmas Eve it comes to earth and takes up its abode within the shining portals of Kings on the Quay. Lights and music, ferns, flowers, shimmering silks, toys for young and old, presents for all. Christmas trees alight with tinsel and candles, and best of all a real Father Christmas with an attendant group of gauzy fairies to delight the eyes of the hurrying throng. The assistants in their blue and gold overalls add to the air of comic opera which hovers over each department, while even the shopwalkers, in their staid black, add to, and emphasise, rather than detract from the feeling of hilarity which prevails. Of the latter, Mr. Yorke, of the handkerchief, lace and ribbon departments, was surely the straightest and primmest of them all. No furtive young saleswoman sidling in half a minute late could hope to escape his frosty eye, even on rush days such as this. But Dahlia much to her relief was back on time. Back, right on time, amongst the hankies and ribbons, in the counter facing the toy department. How those toys in their brightly coloured boxes seemed to fascinate her—how Reggie would love them! But, of course, presents were not to be thought of this Christmas, anyway. It was such a habit, picking out the things she knew they would like best—a bedjacket for mother, grey kid gloves for Persis.

Gracie, bustling along from the other end of the counter where she was serving a customer, flung her a greeting as she tugged at a refractory ribbon box.

"Out at lunch time, weren't you? Missed Old Yorky's speech. Just the same each year; he must keep it in stock. This is the one day of the year when he unbends. As usual he made his stock joke about the management being willing to assist us in an orgy of Christmas spending. We are allowed to anticipate our January salaries if we wish, and book up goods at the various departments."

"That's a very welcome old chestnut, anyway," murmured Dahlia in reply. "We couldn't do much with one month's screw after board and extras have been paid. Although we'd manage, I daresay, if we were like Katy in the lace department. As soon as one Christmas is over, she starts on presents for the next. But less strong-willed mortals like ourselves—well,

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with the best will in the world, there wouldn't be much frankincense without a little of the gold beforehand."

"You do say some funny things." The box of ribbons had come out at last, and Gracie was preparing to depart to the other end of the counter again. But she stopped for one last word.

"Have you noticed Lucy Cole? Poor kid, she seems rather up against it. She must feel this first Christmas without her mother, they were such pals."

And as Gracie departed, Dahlia cast a swift glance over to the toy counter where Lucy, her paleness accentuated by her blue uniform, was attending to the wants of a stout and comely matron with two small girls in tow. Even

Yes, Berlei made that corset . . . but not for you. It very nearly fits you, but very nearly is very bad business in corsetry, and we'd rather you didn't buy it.

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Despite all the battledress and uniforms we're making, we still produce enough foundations for everyone. So if your usual store hasn't got your particular fitting . . . wait for it. If you have to get it immediately, then your store won't mind if you shop elsewhere.

Please don't take something that's nearly right. We've always given you line, comfort and fit, and so long as Berlei remains, we'll continue to do so.

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1 *Test the fit in a sitting position.*

2 *Look for more freedom at waist and hips than you normally would.*

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at that distance Dahlia could see that her eyes were slightly red and swollen, in spite of a generous application of cream and powder.

At the first slack moment Dahlia dashed across to the toy counter. "Say, Lucy, what's the trouble?"

"It's just the rush and bustle I expect ——"

"And not enough to eat. I'll warrant you haven't had a bite of lunch. How about coming with me for some tea? You'll feel lots better after a snack and a cup of ambrosia."

"Thanks, that's good of you. I'd love to. I just feel a bit upset today. It is my first Christmas without mother, and I just hate the idea of facing Christmas Day without her. I'll be all right though, but the customer I have just served was buying things for her girls, and it came over me all of a sudden how mother used to revel in her Christmas shopping. Even if there wasn't much money—and we never had too much of that—she always "lashed out," as she called it, at Christmas time. She said it was largely the generous expansion, the give, give, give at Christmas that kept us human for the rest of the year."

"Oh, never mind," comforted Dahlia. "It won't be so bad. Well I'll be along for you at tea time."

Back behind her counter, Dahlia could not help thinking of Lucy Cole. No mother, no father, no family. And here was she, nasty, ungrateful girl, with father, mother, brother and sister, to say nothing of Uncle Robert and cousin Sarah, a whole ready-made family to enjoy Christmas with, and she begrudged the little extra exertion it entailed. Christmas—the generous expansion. Well, it looked as though that was what had been wrong with her all day. She may have been tired out other years, but after all there had been the wild exhilaration of buying gifts for the loved ones which was enough to overcome any tiredness. And the joy of picturing their faces and hearing their exclamations of joy! But her thoughts were interrupted by the arrival of another customer, a tall thin young man.

"I want a box of hankies, please, real lace. The best you have in the shop. They are for my mother, and the best of mothers deserves the best of presents, don't you think?"

Dahlia smiled at him in a friendly fashion as she pulled down the boxes, but behind the smile was a queer little tugging ache—"the best of mothers"—and Lucy Cole had no mother to remember, and yet she, Dahlia, was trying to back out of the joy of Christmas. She thought of the three wise men, riding slowly and solemnly through the night with the best gifts they could afford. . . . .

As the young man picked up his change and turned back into the throng of shoppers with his precious parcel clutched tightly in his hand, she heard someone calling her name softly, and there was Persis at the other end of the counter. Of course, Christmas Eve, and things were always slack for Persis at the office by this time—she had probably finished up for the holidays already.

"Dahlia," whispered Persis as she looked round to make sure there was no one within earshot. "You can do as you like yourself, but this 'pact' is off as far as I am concerned. I've come in now to buy the family presents. I just can't go through with it, and I am sure Mum and Dad don't feel really happy about it, though they will probably stick to the programme and come to the Bay tomorrow. But Mum is determined that Uncle Robert and cousin Sarah shan't go without their Christmas dinner, so she's been quietly cooking Christmas puddings and mince pies and all the rest of the frills while we have been out of the way. I found them stored away in the box-room when I was hunting out my old tennis shoes. And there's a turkey at home in the process of being stuffed—I heard Dad say apologetically to Mum that he clean forgot about the pact, and bought it from force of habit! So I'm going the whole hog, and shall spend every bean I've saved on presents for everybody."

Dahlia's face lit up with delight.

"I'm with you, Persis! I've thought myself that the 'pact' was a mistake anyway. And do send a wire to Uncle Robert and cousin Sarah, telling them to turn up tomorrow as per schedule. After all we can have our celebration tomorrow, and go to the Bay on Boxing Day."

Persis' smile was a foregone conclusion, but she disappeared into the crowd without a disapproving murmur at the change in plans.

Dahlia could hardly wait to be relieved at five o'clock, but once away from her counter, she dashed to the dress department, and found the daintiest silk blouse for her mother, and a pretty knitted bedjacket. At "gloves" she bought a present for Persis—grey kid, and the best she could get—together with a large bottle of perfume. Then off she flew to the men's, where a dressing gown with slippers to match were neatly tied up into a parcel for Dad. Ties and hankies for Uncle Robert, and a gay scarf for cousin Sarah, and lastly came crackers and paper hats from the stationery. Back at last to the toy department she smiled at Lucy.

"How about that bite of tea? When do you come off?"

"Any time now; I was only waiting for you ——"

"Right—I'm ready. And you had better not forget that you're spending the day with us tomorrow. Just a family affair, but we always have lots of fun. And now, just before we have our tea, what about letting me have a present for Reggie? I want a box of those red soldiers—no, not that one, the big one, the very biggest you've got! I feel extravagant tonight."

As the two girls turned to go towards the cloak room, Dahlia almost collided with Mr. Yorke as he pursued his slow and stately walk through the crowded store. Her apologies were cut short as he smiled at her indulgently.

"Why, Miss Jackson, what a hurry you're in tonight! You narrowly missed knocking me over, young lady!"

Dahlia shot him a happy grin over the top of her armload of parcels. Somehow she didn't feel the least bit afraid of old Yorky tonight. The expansion of Christmas giving seemed to have made him human, too. Perhaps he had a wife and family at home after all—perhaps he, too, bought extravagant presents on Christmas Eve.

"That's not the only thing I nearly missed, Mr. Yorke," she replied. "I nearly missed Christmas altogether."

And that enigmatic remark caused the worthy shopwalker to look after her in amazement for several seconds before he recollected himself and resumed his stately perambulations!

When Christmas Comes.

When Christmas comes to Maoriland,
Our own New Zealand home,
The skies are blue in Maoriland,
Wherever we may roam.

We see no robins in the snow,
Bright crimson 'gainst the white,
Instead we hear the tuis call
In rapturous delight.

We do not sit by blazing fires
All through our Christmas Day,
But laugh and picnic on the sands
Along the sun-drenched bay.

No, not for us in Maoriland
The cold of English Yule,
For us is sun, and wind, and sea,
And days in bushlands cool.

And then I think that if the Babe
Had known this fairest gem,
He would have chosen Maoriland,
Instead of Bethlehem.

Each year I swear I'll keep a diary;
It's sad my resolutions never last.
To read them you might think I only had
A bunch of Januaries in my past.

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What My Garden Means To Me

I think the entries for this competition must have reached a record number, and it has been most difficult to judge, for so many of you have sent me really worthwhile essays. How I wish I had room to print them all, for I know you would have enjoyed reading every one of them as much as I enjoyed it.

One thing about all the entries that delighted me was to find how so many of you realised that despite the joy that comes from the cultivation of fragrant flowers, the trend today is to grow more and more vegetables. It is grand to know that the slogan "Dig for Victory" means a lot more than mere words to most of you, and to those of you who perhaps long now and again for your sweet-scented flowers instead of your fresh, green vegetables, I would say "Keep on digging — the war cannot go on for ever, and your help means so much to the world today."

And now for the results: First prize goes to Mrs. B. Simpson, Karamea, with "Green Fingers," Titirangi, a very close second.

First Prize

WHAT does my garden mean to me? There are many answers to this question, but one of them takes real priority. These days, "Dig for Victory" is the slogan, and this brings to the mind's eye rows of carrots, parsnips, potatoes, etc., set in an array as orderly as soldiers marching to battle, armed with vitamins and minerals so essential to preserve health and defeat disease.

What a boost of morale, too, to view the lovely flowers in their gay dresses —sturdy marigolds, dainty linaria, sweet-scented mignonette and lavender.

My garden is a refuge from the monotony of the ever-recurring household tasks that are the lot of a mother of four small children. The children love to help in their own way, and this imparts valuable lessons for future application. Health benefits by the outdoor exercise—health of body, satisfaction of mind, and the joy of watching things growing under the touch of sun and rain. It is a constant reminder of God's promise—"While the earth remaineth, seedtime and harvest, and cold and heat, and summer and winter, and day and night shall not cease."—**Mrs. Simpson, Karamea.**

Second Prize:

MY GARDEN means:

Rows of books, from garden almanacs and Gardeners' Guides to Flora Klickman and Elizabeth, of German Garden fame.

Calendars at Christmas, scores of them, all with floral pictures.

Buckets, boxes, washtubs full of neighbours' treasures when they are transferred to other districts.

Old shoes on the back porch, and endless old gloves.

Mud on obviously scrubbed floors.

An empty purse after paying entries to Church flower shows.

A garden shed unlined with prize winners' tickets.

Interminable walks around other people's gardens when afternoon tea is finished.

Spasmodic requests to address Girls' Clubs on Gardens.

All these are everyday things easily expressed in everyday language.

When one comes to write of the more psychic effects that a garden has, one seems to need to write poetry,

A LASTING HAPPINESS

The love of gardening is a seed that once sown never dies, but always grows and grows to an enduring and ever increasing source of happiness. For I hold that the best purpose of a garden is to give delight and refreshment of mind, to soothe, to refine, and to lift up the heart in a spirit of praise and thankfulness. It is certain that those who practise gardening in the best way find it to be so, while to its diligent worker its happiness is like the offering of a constant hymn of praise.

or failing that metrical gift, at least a simple and pure prose. The loveliest bloom is simple, yet with intricate majesty concealed; the loveliest gardens are simple, yet massed with hidden miracles; and the loveliest thoughts they inspire are simple, yet fraught with grand feelings. Simple, therefore, should be the words we use to describe what our gardens mean to us. I have no great literary talent, I cannot put feelings into print. So I close with a letter written from Washington in August of last year by that splendid first lady, Eleanor Roosevelt. I found it framed in a florist's window as I wandered along a side street in our city recently:—

"Flowers add to our joys and comfort us in our sorrows, and I am sure that in wartime we need them more than ever."

—Green Fingers, Titirangi.

Other Entries:

A SPECIALIST once told grandfather that he never need worry about what to eat while he had six vegetables on his plate. So the old man refuses to eat even a mouthful till the required selection is served up; can you imagine it? Of the first two vegetables, potatoes and onions, I have a good stock, purchasing what I cannot grow. For greens, when there are no cabbages, curly kale and silver beet make a year round standby. Fourthly, through the seasons, different little sowings of broad beans are made, to come in when the summer varieties are not available. For the fifth, artichokes are easily grown and keep well in the ground. A bit of either carrot or parsnip makes the sixth.

Lettuce planted at intervals provides salad over a long period. Any spare vegetable is given away to neighbours. Sometimes little gifts come back in the form of something I have none of, like a few tomatoes or green peas. Everyone knows about granddad, how he loves to eat his way through the six vegetables, then sleeps peacefully through the afternoon. The old man gave me a grand start in life, including a lovely home. So, in his extreme old age, it is my pride to see that he has always "six vegetables on his plate."—**Flo, Otorohanga.**

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ONLY a true garden-lover can measure the depth of joy which a garden gives to the one who creates it, so I find words inadequate when I want to tell you how much my garden means to me. My garden isn't just earth and flowers and shrubs and trees. It is full of friends and places and memories. Some of my plants are almost sacred to me. There is a cactus plant which was growing on a "tapu" place where the first kumeras were planted in New Zealand, on the shores of Lake Whakatane—a Maori gave it to me. Often my friends walk in my garden, and they admire the rock terraces, the crazy paved paths and steps, and the lily-pool spanned by a tiny bridge which leads to the summer-house. And when they ask me how I can grow such tulips, such brilliant rock flowers, such lilies, I am remembering the nights I lay awake planning how I could turn a gorse-covered hill into a garden. I am remembering the days and months I toiled, sometimes in the mud and rain, and sometimes in the scorching heat, carrying rocks, digging and planting. And I am remembering, too, how hard Hubby worked with me, sometimes by the light of a lantern. I recall with a chuckle his weary, humorous comment as he wheeled the last great barrow-load of rocks to the terrace—"My dear, you should have married a horse!" Oh, there's no joy like the joy of creating a garden! And flowers are such lovely things to give away that they take fragrance from my garden into drab homes and sick rooms—it is in this overflow of flower fragrance to others that I find my greatest garden happiness. — **Blackberry, Southland.**

Until then . . .

When the troopships come steaming back across the oceans with lights ablaze . . . and the gallant fighting men they carry are coming Home—not merely on furlough—but with their task nobly done and Victory truly won:

Until then, we in New Zealand must make our sacrifices. We must go without new cars. We must save tyres and petrol, so that our fighting forces can have all *they* need.

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I FIND today that the family must be fed, clothed and comfortably housed, and I find my garden, apart from giving me hours of pleasure, as well as a little hard work, enables me to dish up most appetising meals with vegetables freshly picked. This saves me many extra shillings, and so enables me to get many little things that the kiddies need, or something for the house that I wouldn't be able to have had I no garden, and instead bought all our vegetables. They are such a price these days, too! Besides, I think I would get the blues if I didn't have my garden to go out into, and to watch the plants growing. I find by making a practice of putting two hours a day into the garden I can keep a flower garden, two big lawns cut, and have plenty of vegetables which are in season all the year round, and that goes to say that my garden cuts my store bill in half.—**Cockie's Wife, Northland.**

* * *

One is nearer God's heart in a garden
Than anywhere else on earth.

Competitions.

DECEMBER:

How are your noses behaving themselves now? No, I don't mean, have you a summer cold, or hay fever, or anything like that. Surely you have not forgotten our next competition: "Smells I have smelt." Out with your pens, and let's have them. This competition closes on January 15th, so don't be late.

JANUARY:

War-time has brought to us many new and hitherto undreamed of economies. First there was tea and sugar rationing, and now butter, to say nothing of the numerous necessities and luxuries that have disappeared altogether from the market. So let's share our thoughts this month by telling what we miss most in these war-time days. It should be interesting to compare notes. Do you know what I miss most? Well, mine is a "luxury-miss," but they are sometimes the hardest of all to do without. And it is this: I miss the supplies of excellent recordings that used to find their way into the country, recordings of world famous orchestras and stars in songs and melodies equally as famous. Now, how about you?

"WHAT I MISS MOST NOW IT IS WAR-TIME."

Two prizes as usual: First 10/- and second 5/-, and this competition closes on February 15th.

"MARY,"
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SPIRIT OF CHRISTMAS

CHRISTMAS! The very word seems to conjure up a vision of a landscape shrouded in soft, white snow; of bright-red holly berries amidst dark-green leaves, decorating the pictures on the walls and the chandeliers; of mistletoe, outward and visible sign of a merry Yuletide custom.

And do not forget the plum pudding wreathed in bluish flame, and carried in triumph to the dining-room, or the muscatels and raisins, nuts and crackers. All these thoughts pass through our minds at the mention of Christmas, while the soft chimes of the Christmas bells ring through our memories. Strange, too, that He whose birthday we celebrate knew none of these things. Instead, a lowly stable, a bed of straw, a round white moon in a purple sky, and one bright star in the east are the thoughts associated with that first Christmas.

EXILE

Christmas: the heart of me
Deep with dull longing
For a home that I'll not know again.
Christmas: the soul of me
Laden with memory
Of a laughing-faced girl in a glen.
Sad is the heart of me
Now it is Christmas
And everyone else is so gay.
Sad that my misery,
Born of dull longing,
Should burn through the glad happy day.
Alas, though it's Christmas,
And time for rejoicing,
My heart deeply longs in its pain
For a sun-dappled glen
A laughing-faced girl,
And a home that I'll not know again.

Rites and Symbols

In these modern days, we still associate Christmas with all the old rites and symbols that have been kept alive down the centuries by our fathers and forefathers. And the happiest custom of Christmas is the giving of presents. This is an old custom which will never die out. This year, it is going to be difficult to find presents, what with rationing of many articles, and the prohibitive price of others, but whatever you do, do make an effort to give something this Christmas, be it ever so small. Remember that it is the thought that counts, not the gift.

So let us guard the spirit of Christmas, the glorious giving of gifts made and fashioned in hours that are perhaps ill-spared in these busy days. Let us turn back the pages of time for a few generations, and teach our children to sew for their Christmas gifts.

Wide Range

There are so many things that nimble fingers can fashion from odds and ends—hanky sachets from left-overs of organdie, oven cloths from sugar sacks, covered coat-hangers, always a useful and acceptable gift, lavender bags—use your imagination and you will find there is no limit to the gifts that you can make, and can teach your children to make, too. But whatever happens, don't let the spirit of Christmas become buried in the rush and economy of these war-time days. Now, more than ever before, we must keep alive those customs which meant so much to our forefathers, and which mean so much to future generations.

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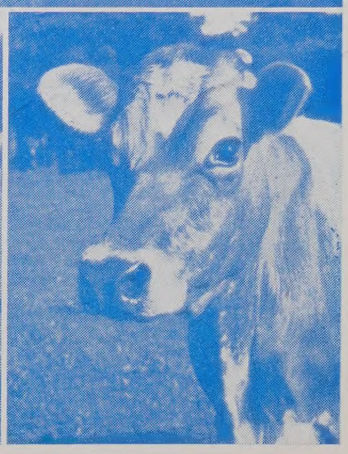

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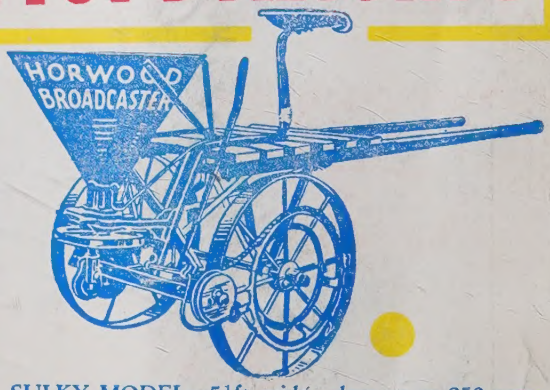

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